TABLE 5.5-20 Cont'd

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area	Land Use Plans/ Priorities	On-reserve Services	On-reserve Infrastructure
Popkum 1	5	n/a[2]	n/a[2]	Proposed Pipeline Corridor	Utility corridor, residential use, CN Rail	Unknown [4]	Utility corridor
Popkum 2	n/a[1]	n/a[2]	n/a[2]	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data for this area has been suppressed for data quality or confidentiality reasons.

3 This information is not required for this IR as the IR is located beyond the proposed pipeline corridor.

4 Data could not be found in desktop research or field notes.

Key economic activities of Popkum First Nation include those associated with the Stó:lō Nation Society as described in Section 5.5.1.

Records from the socio-economic interview conducted with Popkum First Nation indicate that the economic goals of the Band include the potential development of a recreational fishing lodge or cabins along the river, residential development on the IR (currently there is one house but there is interest in building seven more), and continued collaboration with industry partners on projects on IR lands.

It was noted that the Band does not have a five-year plan nor a land use plan, does not rely on the federal government for capital grants, and has a preference for working with industry. There is also interest in developing a truck stop; a dirt bike track developed four years ago has been successful. An opportunity may exist to develop ATV tourism using decommissioned logging roads and historical trails.

The community indicated that training opportunities for the development of transferable skills are important to the future of the Band, and opportunities exist to build on existing partnerships with Jake Construction and Seabird Island First Nation.

According to records of Aboriginal engagement, the Seven Generations Environmental Group provides environmental management and impact assessment; regulatory applications and permitting; resource planning; water resource management; environmental and construction monitoring; biological and ecological assessments; electrofishing and fish salvage.

Traditional harvesting (*i.e.,* hunting, fishing, and gathering for subsistence purposes) continues to be an important element of livelihood and culture for Popkum First Nation members. Band members still exercise traditional fishing methods of trapping and spearing fish (salmon), as well as commercial fishing methods. Cedar and moss are picked and sold commercially and Band members continue to gather these plants. Mount Cheam (located less than 3 km from the Project) is of important cultural significance to Popkum First Nation. The results of Aboriginal engagement for the Project indicate that if construction and reclamation are conducted responsibly, it is possible for plant and animal communities to return to a disturbed area over time.

The Traditional Land and Resource Use Technical Report of Volume 5D provides further information on Popkum First Nation's traditional land and resource use and cultural practices.

There are a range of Band-administered community services and infrastructure. Services and programs provided by the Stó:lō Nation Society are listed in Section 5.5.1.

Popkum 1 has a utility corridor for transmission line, rail and other utilities, and there is a desire to bring back CN shipping capability.

Key Project-related issues that have been raised by the Popkum First Nation during engagement include:

- there is the potential for positive and negative impact on member-owned businesses;
- Trans Mountain may be able to store pipe and equipment on IR lands where the Band plans to eventually develop an industrial park;
- the Band is interested in being involved in the Project and providing storage space for equipment and materials, leasing space for work camps, and being involved in construction to whatever extent the community has the means and capacity to do so;
- impacts to quality of life are anticipated to be positive; and
- community health services do not anticipate that they will be burdened by the Project.

5.5.11 Scowlitz First Nation

The Scowlitz First Nation is a Stó:lō band located near the community of Lake Errock, BC (AANDC 2012) and as a member of the Stó:lō Tribal Council have not been part of the Treaty Process (Stó:lō Tribal Council 2011). As of 2013, the total population of the Scowlitz First Nation was 245 (of which roughly 145 are registered), with 90 to 100 Band members living on IRs, as per information gleaned from the socio-economic interview conducted with Scowlitz First Nation. There are four Scowlitz First Nation IRs (AANDC 2012). The main IR and location of the Band headquarters is Squawkum Creek 3 (AANDC 2012). Members of the Scowlitz First Nations obtain some services from the Seabird Island Band (Seabird Island Band 2013). See Section 5.5.12 for information on the Seabird Island Band and associated IR and services.

An overview of the Scowlitz First Nation is provided in Table 5.5-21.

TABLE 5.5-21

SCOWLITZ FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 245 On IRs: 100 Off IRs: 145	Stó:lō Tribal Council	Hul'q'umi'num'/ Halq'eméylem	Canoe Races with neighbouring communities, smoke house, Hunting Fishing Gathering Totem pole carving	Economic development goal: improve health and employability (performing a needs assessment for training and education)

Note: Information for this table was sourced from Aboriginal community participation in Project-specific biophysical field studies and/or socio-economic interviews.

More details on Scowlitz First Nation IRs are provided in Table 5.5-22. None of the Scowlitz IRs are crossed by the proposed pipeline corridor; however, Pekw'Xe:yles, Scowlitz 1 and Williams 1 are located in the Socio-Economic RSA. The Squawkum Creek 3 IR is located outside the Socio-Economic RSA.

TABLE 5.5-22

SCOWLITZ FIRST NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area
Pekw'Xe:yles (Peckquaylis)	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA
Scowlitz 1	10	n/a[2]	n/a[2]	Socio-Economic RSA
Squawkum Creek 3	108	75	n/a[1]	Outside Study Area
Williams 2	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data for this area has been suppressed for data quality or confidentiality reasons.

The following information was gleaned from records of the socio-economic interview conducted with Scowlitz First Nation leadership.

- The primary employer for members of the Scowlitz First Nation is the Band office.
- Barriers to finding work include lack of transportation, social isolation, addiction, health issues, mental health issues, and lack of motivation and self-esteem. Band members who have left the IR have done so to look for work or because of the housing shortage on the IR.
- There is no public transit available but most Band members do have vehicles.
- Immediate improvement to health services (for both physical and mental health) would help to eliminate barriers to employment.
- Roughly 55 Band members on the IR are between 15 and 64 years of age, and only one in four is employed. Roughly 75 members living on the IR have finished high school and a quarter have trades training.
- The Band is pursuing a needs assessment for training and education. While there is no official training plan, the Band does try to train members. For example, when council decided to build a new longhouse, it was determined that it should be built by members.
- One of the issues that the community faces when it comes to training is that programs are short-term; they are created and initiated, but after six months or a year the funding stops, which leads to a lack of training continuity.
- There is no economic development corporation, but the Band expects to have one by April 2014.
- Key training and educational priorities for the community include programming funded by the SASET program (SASET 2011). More information on SASET's mandate is available in Section 5.5.2.

Feedback from Project-related Aboriginal engagement indicated that Band members participate in traditional cleansing/bathing, and the community is constructing a longhouse, playground and skate park to promote community activities, youth sports, and Scowlitz culture and to help battle substance abuse in the community. Popular community activities include soccer and totem pole carving.

The following information was gleaned from the socio-economic interview conducted with members of the Band's leadership.

- There are two Band members on the IR who speak the traditional language of Halq'eméylem.

- Important cultural practices include fasting and spiritual baths.
- Products of traditional harvesting are not typically sold for income, but roughly 4-5 band members hunt, 10-12 fish, and 15 gather traditional plants.
- Workshops on gathering medicinal plants are offered by the Band and young children and youth engage in plant gathering.
- The Fraser River was identified as the key to life and livelihood for the Band as well as its neighbours.

Key Project-related issues that were raised by Scowlitz Fist Nation during Project-related engagement include:

- there are no concerns about the Project impacting the Band's culture or population;
- health concerns about the Project potentially compounding air pollution issues that already exist in the area; and
- concerns about the effects of the Project on the Fraser River both upstream and downstream.

5.5.12 Seabird Island Band

The Seabird Island Band is a Stó:lō band located in the Upper Fraser Valley of BC, approximately 3 km north of the Community of Agassiz (AANDC 2012, Seabird Island Band 2013). Seabird Island Band is a member of the Stó:lō Tribal Council and, as such, has not been part of the Treaty Process (Stó:lō Tribal Council 2011). Seabird Island Band provides services to a number of other First Nations in the realm of health, education, employment, housing, capital services, business opportunities and child and family services (Seabird Island Band 2013). The other nations served by Seabird Island Band's services are Chawathil First Nation, Scowlitz First Nation, Kwaw-Kwaw-Aplit, Shxw'ōwhámel First Nation and Union Bar First Nations. The following First Nations receive some services on a contract basis: Skwah, Cheam, Boston Bar, Spuzzum and Chehalis. As of 2013, the total population of Seabird Island Band was 921 people, of which 583 live on IRs and 338 live off IRs (AANDC 2013a). There are two Seabird Island Band IRs (AANDC 2013). The main IR and location of the Band headquarters is Seabird Island (AANDC 2012, Seabird Island 2013).

An overview of the Seabird Island Band is provided in Table 5.5-23.

TABLE 5.5-23

SEABIRD ISLAND BAND – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 921 On IRs: 583 Off IRs: 338	Stó:lō Tribal Council	Hul'q'umi'num'/ Halq'eméylem/ hənqəminəm	Medicinal plants Gathering	Band-owned businesses and partnerships: • Seabird Island Gas Bar and Convenience Store • Stqo:ya Construction Ltd. Band economic activities: • gravel processing • land leases • hazelnut orchard • eco-tourism • forestry

Sources: AANDC 2012, AANDC 2013a, FPLM 2013, KMC 2013b, Seabird Island Band 2013

More details on Seabird Island Band IRs are provided in Table 5.5-24. None of the Seabird Island Band IRs are crossed by the proposed pipeline corridor, however, Pekw'Xe:yles and Seabird Island are located in the Socio-Economic RSA (AANDC 2012).

TABLE 5.5-24

SEABIRD ISLAND BAND – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area
Pekw'Xe:yles	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA
Seabird Island	594	435	22.2%	Socio-Economic RSA

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Note: 1 Statistics Canada does not provide information for this community.

Key economic activities of the Seabird Island Band include Seabird Island Gas Bar and Convenience Store, gavel processing, land leases, hazelnut orchard, eco-tourism and forestry. The Seabird Island Band's economic development strategies (*i.e.,* potential projects) include the development of non-native housing on the IR, a commercial centre, an eco-industrial park, an RV park and campground, a museum and a longhouse. Additionally, the Seabird Island Band has a number of facilities available for rental, and offers the Seabird Island Catering Program which was developed to allow those working as caterers to fundraise for programs such as youth sports and travel clubs. The Seabird Island Graphic Communications service produces marketing and promotional materials for internal use and for First Nations health associations for a minimal fee. Another Band-owned business is Seabird Wi-Fi, which offers Seabird Island community members wireless internet at a low cost (Seabird Island Band 2013). Key training and educational priorities for the community include programming funded by the SASET program (SASET 2011). More information on SASET's mandate is available in Section 5.5.2. Many Seabird Island members living on the IR are on social assistance, and substance abuse is a prominent problem. Engagement records indicate that Stqo:ya Construction Limited provides civil construction, road construction and maintenance; access roads; culvert installation; foundation excavating; clearing and grubbing; right-of-way maintenance; logging; and hydrovac truck services.

The results of Aboriginal engagement for the Project indicate that the Band office employs about 500 people, while many young people have gone to Alberta to work in the oil and gas industry. The college on the IR offers training programs in trades and business, but many people look for work off the IR to find jobs outside of the Band office. Looking for work off IRs presents its own challenges, as the cost of living is higher off IRs and finding work can be difficult because many Band members lack the necessary qualifications.

The results of Aboriginal engagement for the Project indicate that plants and animal bi-products are used for traditional and ceremonial purposes. Berries, mushrooms, stinging nettle and briars are collected for subsistence purposes. Band members use plants for ceremonial purposes, for creating traditional crafts, for consumption, and for medicinal purposes. Band members also continue to hunt deer and fish commercially, recreationally and for subsistence purposes. Fishing is done using dip nets. Some traditionally fished species are protected and can no longer be harvested.

The Seabird Island Band provides the following education services (Seabird Island Band 2013):

- Lalme'lwesawtexw (Seabird Island Community Elementary and Secondary School);
- Lalme'lwesawtexw Adult Education;
- Seabird College; and

- scholarships, grants and incentives.

The Seabird Island Band provides the following health services (Seabird Island Band 2013):

- recreation;
- active lifestyle and nutrition;
- doctor's office;
- dental clinic;
- chronic care and home support;
- pre and post natal care;
- health outreach programs;
- mental health and addictions; and
- optometry, mammogram and specialty clinics.

The Seabird Island Band began working on a comprehensive community plan for the Seabird Island IR in 2009.

Key Project-related issues that have been raised by the Seabird Island Band during engagement include concern about effects on fish spawning habitat for commercial, recreation and subsistence fisheries.

5.5.13 Shxw'ōwhámel First Nation

The Shxw'ōwhámel First Nation is a Stó:lō band located approximately 13 km west of the District of Hope, BC along the Trans Canada Highway. As a member of the Stó:lō Tribal Council, the Shxw'ōwhámel First Nation has not been part of the Treaty Process (Stó:lō Tribal Council 2011). As of 2013, the total population of Shxw'ōwhámel First Nation was 184 people, of which 101 live on IRs and 83 live off IRs (AANDC 2013a). There are four Shxw'ōwhámel First Nation IRs (AANDC 2012). The main IR and location of the Band headquarters is Shxw'ōwhámel1, formerly known as Ohamil 1 (AANDC 2012, Shxw'ōwhámel First Nation 2012). Members of the Shxw'ōwhámel First Nation obtain some services from the Seabird Island Band (Seabird Island Band 2013). See Section 5.5.12 for information on the Seabird Island Band and associated IR and services.

An overview of the Shxw'ōwhámel First Nation is provided in Table 5.5-25.

TABLE 5.5-25

SHXW'ŌWHÁMEL FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 184 On IRs: 101 Off IRs: 83	Stó:lō Tribal Council	Halq'eméylem (upriver dialect of Halkomelem)	Hunting Fishing Gathering Regalia Traditional drum making Sweat lodges	Band economic activities: • Extensive contracting work for energy industry • Logging/forestry – PDQ Contracting (silviculture services including: brushing, weeding, slashing, creek cleaning)

Sources: AANDC 2012, AANDC 2013a, FMPL 2013, KMC 2013b, Shxw'ōwhámel First Nation 2012, Statistics Canada 2012

Notes: Certain information was sourced from Aboriginal community participation in Project-specific biophysical field studies and/or socio-economic interviews.

More details on Shxw'ōwhámel First Nation IRs are provided in Table 5.5-26. Of the Shxw'ōwhámel First Nation IRs, Shxw'ōwhámel 1 is crossed by the proposed pipeline corridor and Kuthlaith 3, Pekw'Xe:yles and Wahleach Island are in the Socio-Economic RSA.

TABLE 5.5-26

SHXW'ŌWHÁMEL FIRST NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area	Land Use Plans/Priorities	On-reserve Services	On-reserve Infrastructure
Shxw'ōwhámel1 (Formerly Ohamil 1)	77	50	n/a[1]	Proposed pipeline corridor	Unknown[3]	Unknown[3]	Unknown[3]
Kuthlaith 3	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[2]	n/a[2]	n/a[2]
Pekw'Xe:yles	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[2]	n/a[2]	n/a[2]
Wahleach Island	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[2]	n/a[2]	n/a[2]

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 This information is not required for this IR as the IR is located beyond the proposed pipeline corridor.

3 Data could not be found in desktop research or field notes.

Key economic activities of the Shxw'ōwhámel First Nation include contract work for the energy industry such as brushing and clearing, providing aggregate supply, equipment assembly, general construction, waste management, trucking services, traffic control, road construction, environmental monitoring services, heavy equipment operation and logging/forestry services (Shxw'ōwhámel First Nation 2012). Key training and educational priorities for the community include programming funded by the SASET program (SASET 2011). More information on SASET's mandate is available in Section 5.5.2.

The results of Aboriginal engagement for the Project indicate that Band members harvest wild mushrooms for subsistence and for commercial sale (although the market has declined in recent years). Band members gather wild berry species such as huckleberries, raspberries, and soapberries for subsistence purposes. Trees are used for ceremonial purposes and to make snowshoes, hats, baskets and regalia. Other plants are dried and boiled to make teas which have medicinal properties. The results of aboriginal engagement for the Project indicate that plants, wildlife such as deer, and fish are valued for subsistence and economic reasons, as Band members continue to hunt and fish for subsistence purposes.

Drum making is a traditional art form practiced by the Shxw'ōwhámel First Nation people to this day (Shxw'ōwhámel First Nation 2012), as is basket weaving. Traditional economic activities often occur alongside some level of seasonal wage employment. Traditional harvesting (*i.e.,* hunting, fishing, and gathering for subsistence purposes) continues to be an important element of livelihood and culture for Shxw'ōwhámel members. Boxwood and mosses are collected for sale. Sweat lodges are used for ceremonial and healing purposes.

The Traditional Land and Resource Use Technical Report of Volume 5D provides further information on Shxw'ōwhámel First Nation's traditional land and resource use and cultural practices.

The Shxw'ōwhámel First Nation provides the following programs for Band members:

- Head Start;

- Someone So Small;
- swimming and skating;
- Bear Bus;
- pancake breakfasts on Tuesdays;
- an alcohol and drug counsellor; and
- an employment counsellor.

Key Project-related issues that have been raised by Shxw'ōwhámel First Nation during engagement include:

- opportunities exist for training for pump station employment and construction contracts, which will build employment capacity with the Band and develop transferable skills;
- concern that fish species harvested for subsistence purposes could be affected by construction;
- concern about spills, construction process and water contamination (resulting in health effects on fish collected for consumption);
- disruption to medicinal plants during construction can be mitigated by avoiding areas with species at risk; allowing First Nations community members to harvest plants pre-construction; and using various reclamation techniques that minimize erosion and facilitate plant growth; and
- concern that the Project may affect or affect access to sacred or ceremonial sites.

5.5.14 Shxwha:y Village

The Shxwha:y Village is a Stó:lō band located west of the City of Chilliwack, BC and is a signatory member of the Framework Agreement on First Nation Land Management (Skxwha:y Village Land Code 2006). As of 2013, the total population of Shxwha:y Village was 390 people, of which 98 live on IRs and 292 live off IRs (AANDC 2013a). There are four Shxwha:y Village IRs (AANDC 2012).

A description of the Stó:lō asserted traditional territory is provided in Section 5.5.1.

An overview of the Shxwha:y Village is provided in Table 5.5-27.

TABLE 5.5-27

SHXWHA:Y VILLAGE – OVERVIEW

Band Population	Tribal or Treaty Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 390 On IRs: 98 Off IRs: 292	Unknown[1]	Hul'q'umi'num'/ Halq'eméylem/ hənqəmin̓əm	Winter Dance Mask Dance Regalia placement Cleansing/bathing Fasting/sweat ceremony/burning for ancestors Weaving Carving Hunting Fishing Plant gathering Trapping Drying meat Tanning hides	Band partnership: Ts'elxweyeqw Tribe Management Limited

Sources: AANDC 2013a, KMC 2013b , Ts'elxwéyeqw Tribe Management Limited *et.al.* 2013

Notes: 1 Data could not be found in desktop research or field notes.

More details on Shxwha:y Village IRs are provided in Table 5.5-28. Of the Shxwha:y Village IRs, Grass 15 is crossed by the proposed pipeline corridor and Pekw'Xe:yles, Skumalasph 16 and Skway 5 are in the Socio-Economic RSA. The remaining Shxwha:y Village IRs are located outside the Socio-Economic RSA.

TABLE 5.5-28

SHXWHA:Y VILLAGE – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/Socio-Economic RSA/Outside Study Area	Land Use Plans/Priorities	On-reserve Services	On-reserve Infrastructure
Grass 15	n/a[1]	n/a[1]	n/a[1]	Proposed Pipeline Corridor	Unknown[2]	Unknown[2]	Unknown[2]
Pekw'Xe:yles	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]
Skumalasph 16	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]
Skway 5	98	70	n/a[1]	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data could not be found in desktop research or field notes.

3 This information is not required for this IR as the IR is located beyond the proposed pipeline corridor.

Shxwha:y Village is involved with the Ts'elxweyéqw Tribe, an umbrella organization involved in business and government partnerships, land use planning and economic initiatives in partnership with or on behalf of the communities it represents (Ts'elxweyéqw Tribe 2013).

According to engagement records, Ts'elxweyeqw Tribe Management Limited provides forest management services for oversight of all aspects of forestry projects including overseeing contractors or subcontractors; right-of-way work; road building; vegetation management; engineering consulting; biological assessments; and environmental monitoring.

Key training and educational priorities for the community include programming funded by the SASET program (SASET 2011). More information on SASET's mandate is available in Section 5.5.2.

Project-related issues raised by Stó:lō community members and traditional and cultural practices of the communities involved in the Indicator Report for the Integrated Cultural Assessment for the Proposed Trans Mountain Expansion Project (Ts'elxwéyeqw Tribe Management Limited et. al. 2013) are provided in Section 5.5.1.

5.5.15 Skowkale First Nation

The Skowkale First Nation (Skowkale) is a Stó:lō band located near the City of Chilliwack in the Upper Fraser Valley (AANDC 2012, Skowkale First Nation 2010). The band is a member of the Stó:lō Nation Society, and many of the Skowkale's economic and social initiatives and services are associated with this tribal council (Stó:lō Nation Society 2009). Skowkale are part of the Stó:lō Xwexwilmexw Treaty Association which is working through the treaty process with the BC Treaty Commission (Stó:lō Xwexwilmexw Treaty Association 2013). As of 2013, the total population of the Skowkale was 248 people, of which 177 live on IRs and 71 live off IRs (AANDC 2013a). There are four Skowkale IRs (AANDC 2012).

A description of the Stó:lō asserted traditional territory is provided in Section 5.5.1.

An overview of the Skowkale First Nation is provided in Table 5.5-29.

TABLE 5.5-29

SKOWKALE FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 248 On IRs: 177 Off IRs: 71	Stó:lō Nation Society	Halq'eméylem (upriver dialect of Halkomelem)	Winter Dance Mask Dance Regalia placement Cleansing/bathing Fasting/sweat ceremony/burning for ancestors Weaving Carving Hunting Fishing Plant gathering Trapping Drying meat Tanning hides	Band partnerships: • Stó:lō Development Corporation; • Stó:lō Community Futures; • Stó:lō Tourism Commission • Ts'elxweyeqw Tribe Management Limited • Seven Generations Environmental Group

Sources: AANDC 2012, AANDC 2013a, KMC 2013b, Stó:lō Nation Society 2009, Ts'elxwéyeqw Tribe Management Limited et.al. 2013

More details on Skowkale First Nation IRs are provided in Table 5.5-30. Grass 15, an IR shared with other First Nations as described in Table 3.3-3, is crossed by the proposed pipeline corridor, and Pekw'Xe:yles, Skowkale 10 and Skowkale 11 are located in the Socio-Economic RSA (AANDC 2012).

TABLE 5.5-30

SKOWKALE FIRST NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/Socio-Economic RSA/Outside Study Area	Land Use Plans/Priorities	On IRs Services	On IRs Infrastructure
Grass 15	n/a[1]	n/a[1]	n/a[1]	Proposed pipeline corridor	Unknown[2]	Unknown[2]	Unknown[2]
Pekw'Xe:yles	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]
Skowkale 10 & 11	795	695	12.8%	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data could not be found in desktop research or field notes.

3 This information is not required for this IR as the IR is located beyond the proposed pipeline corridor.

Skowkale First Nation is involved with the Ts'elxweyéqw Tribe, an umbrella organization that has been involved in business and government partnerships, land use planning and economic initiatives in partnership with or on behalf of the communities it represents (Ts'elxweyéqw Tribe 2013).

Key economic activities of the Skowkale First Nation include those associated with the Stó:lō Nation Societyand are described in Section 5.5.1 along with Project-related issues raised by Stó:lō community members and traditional and cultural practices of the communities involved in the Indicator Report for the Integrated Cultural Assessment for the Proposed Trans Mountain Expansion Project (Ts'elxwéyeqw Tribe Management Limited et. al. 2013).

According to records of Aboriginal engagement for the Project, Ts'elxweyeqw Tribe Management Limited provides forest management services for oversight of all aspects of forestry projects to include oversight of contractors or subcontractors; right-of-way work; road building; vegetation management; engineering consulting; biological assessments; environmental monitoring; archaeological & cultural use assessment; potentially contract site inspection services and GIS. The Seven Generations Environmental Group provides environmental management and impact assessment; regulatory applications and permitting; resource planning; water resource management; environmental and construction monitoring; biological and ecological assessments; electrofishing and fish salvage. Additionally, the Stó:lō Nation commercially fishes pink salmon in the Fraser River.

More information on the traditional and cultural practices of Stó:lō nations, services and programs provided by the Stó:lō Nation Society, and concerns raised by Stó:lō community members regarding this are listed in Section 5.5.1.

5.5.16 Skwah First Nation

The Skwah First Nation is a Stó:lō band located near the City of Chilliwack in the Fraser Valley of BC (FPLMBC 2013) and is not affiliated with any tribal council (MARR 2013). As of 2013, the total population of Skwah First Nation was 505 people, of which 289 live on IRs and 216 live off IRs (AANDC 2013a). There are six Skwah First Nation IRs (AANDC 2012).

A description of the Stó:lō asserted traditional territory is provided in Section 5.5.1.

An overview of the Skwah First Nation is provided in Table 5.5-31.

TABLE 5.5-31

SKWAH FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 505 On IRs: 289 Off IRs: 216	None	Halq'eméylem (upriver dialect of Halkomelem)	Winter Dance Mask Dance Regalia placement Cleansing/bathing Fasting/sweat ceremony/burning for ancestors Weaving Carving Hunting Fishing Plant gathering Trapping Drying meat Tanning hides	Band partnerships: • Stó:lō Development Corporation; • Stó:lō Community Futures; • Stó:lō Tourism Commission • Ch-ihl-kway-uhk Forestry Limited Partnership

Sources: AANDC 2012, AANDC 2013a, FPLM 2013, Squiala First Nation 2012, Stó:lō Nation Society 2009, Ts'elxwéyeqw Tribe Management Limited *et.al.* 2013

More details on Skwah First Nation IRs are provided in Table 5.5-32. The Grass 15 is crossed by the proposed pipeline corridor and Skwah 4, Skwahla 2, Skwali 3, Schelowat 1 and Skumalasph 16 are located in the Socio-Economic RSA.

TABLE 5.5-32

SKWAH FIRST NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area	Land Use Plans/Priorities	On-reserve Services	On-reserve Infrastructure
Grass 15	n/a[1]	n/a[1]	n/a[1]	Proposed Pipeline Corridor	Unknown[3]	Unknown[3]	Unknown[3]
Skwah 4	216	160	33.3%	Socio-Economic RSA	n/a[4]	n/a[4]	n/a[4]
Skwahla 2	n/a[2]	n/a[2]	n/a[2]	Socio-Economic RSA	n/a[4]	n/a[4]	n/a[4]
Skwali 3	10	n/a[2]	n/a[2]	Socio-Economic RSA	n/a[4]	n/a[4]	n/a[4]
Schelowat 1	10	n/a[2]	n/a[2]	Socio-Economic RSA	n/a[4]	n/a[4]	n/a[4]
Skumalasph 16	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[4]	n/a[4]	n/a[4]

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data for this area has been suppressed for data quality or confidentiality reasons.

3 Data could not be found in desktop research or field notes.

4 This information is not required for this IR as the IR is located beyond the proposed pipeline corridor.

Key training and educational priorities for the community include programming funded by the SASET program (SASET 2011). More information on SASET's mandate is available in Section 5.5.2.

The Skwah First Nation is involved in the Ch-ihl-kway-uhk Forestry Limited Partnership, which is a partnership between the seven Ts'elxweyeqw Band member First Nation communities as well as the Kwaw-Kwaw-apilt First Nation (Squiala First Nation 2012).

Project-related issues raised by Stó:lō community members and traditional and cultural practices of the communities involved in the Indicator Report for the Integrated Cultural Assessment for the Proposed Trans Mountain Expansion Project (Ts'elxwéyeqw Tribe Management Limited et. al. 2013) are provided in Section 5.5.1.

5.5.17 Soowahlie First Nation

The Soowahlie First Nation is a Stó:lō band located between the towns of Vedder Crossing and Cultus Lake in the Fraser Valley of BC (Soowahlie Band Administration [SBA] 2012). As of 2013, the total population of Soowahlie First Nation was 370 people, of which 177 live on IRs and 193 live off IRs (AANDC 2013a). There are three Soowahlie First Nation IRs (AANDC 2012). Grass 15, an IR shared with other First Nations as described in Table 3.3-3, covers about 445 hectares of land (SBA 2012).

A description of the Stó:lō asserted traditional territory is provided in Section 5.5.1.

An overview of the Soowahlie First Nation is provided in Table 5.5-33.

TABLE 5.5-33

SOOWAHLIE FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 370 On IRs: 177 Off IRs: 193	Stó:lō Tribal Council	Halq'eméylem (upriver dialect of Halkomelem)	Winter Dance Mask Dance Regalia placement Cleansing/bathing Fasting/sweat ceremony/burning for ancestors Weaving Carving Hunting Fishing Plant gathering Trapping Drying meat Tanning hides	Band-owned businesses and partnerships: • Sweltzer Creek Campground; • Ts'elxweyeqw Tribe Management Limited Band economic activities: • gravel operation; • fisheries; • forestry

Sources: AANDC 2012, AANDC 2013a, KMC 2013b, SBA 2012, Ts'elxwéyeqw Tribe Management Limited et.al. 2013

More details on Soowahlie First Nation IRs are provided in Table 5.5-34. Grass 15 is crossed by the proposed pipeline corridor and Pekw'xe;yles and Soowahlie 14 are located within the Socio-Economic RSA.

TABLE 5.5-34

SOOWAHLIE FIRST NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/Socio-Economic RSA/Outside Study Area	Land Use Plans/Priorities	On-reserve Services	On-reserve Infrastructure
Grass 15	n/a[1]	n/a[1]	n/a[1]	Proposed Pipeline Corridor	Unknown[2]	Unknown[2]	Unknown[2]
Pekw'Xe:yles	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]
Soowahlie 14	187	150	28.6%	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.
2 Data could not be found in desktop research or field notes.
3 This information is not required for this IR as the IR is located beyond the proposed pipeline corridor.

Soowahlie First Nation is involved with the Ts'elxweyéqw Tribe, an umbrella organization that has been involved in business and government partnerships, land use planning and economic initiatives in partnership with or on behalf of the communities it represents (Ts'elxweyéqw Tribe 2013).

The Band owns the Sweltzer Creek Campground at Cultus Lake which consists of 56 sites, a fully equipped washroom, two group tenting areas, a gazebo, a small store, a pay phone, a playground and gravel roads throughout (SBA 2012). The Chief and Council are working to create new employment opportunities to alleviate unemployment in the community, where only about 40% of members are employed (SBA 2012). The Band, in partnership with three other communities, offers the Stepping Stones Community Capacity Building Program designed to help Aboriginal community members living in remote communities to achieve their personal and community capacity-building goals (SBA 2012). The Band also administers health services to its members (SBA 2012). Key training and educational priorities for the community include programming funded by the SASET program (SASET 2011). More information on SASET's mandate is available in Section 5.5.2.

Project-related issues raised by Stó:lō community members and traditional and cultural practices of the communities involved in the Indicator Report for the Integrated Cultural Assessment for the Proposed Trans Mountain Expansion Project (Ts'elxwéyeqw Tribe Management Limited et. al. 2013) are included in Section 5.5.1.

5.5.18 Squiala First Nation

The Squiala First Nation is a Stó:lō band located near the City of Chilliwack in the Upper Fraser Valley of BC (First Peoples' Heritage, Language and Culture Council [FPHLCC] 2012). The Band is a member of the Stó:lō Nation Society, and many of Squiala First Nation's economic and social initiatives and services are associated with this tribal council (Stó:lō Nation Society 2009). As of 2013, the total population of the Squiala was 199 people, of which 136 live on IRs and 63 live off IRs (AANDC 2013a). There are five Squiala IRs (AANDC 2012).

A description of the Stó:lō asserted traditional territory is provided in Section 5.5.1.

An overview of the Squiala First Nation is provided in Table 5.5-35.

TABLE 5.5-35

SQUIALA FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 190 On IRs: 136 Off IRs: 63	Stó:lō Nation Society	Halq'eméylem (upriver dialect of Halkomelem)	Winter Dance Mask Dance Regalia placement Cleansing/bathing Fasting/sweat ceremony/burning for ancestors Weaving Carving Hunting Fishing Plant gathering Trapping Drying meat Tanning hides	Band partnerships: • Stó:lō Development Corporation; • Stó:lō Community Futures; • Stó:lō Tourism Commission forestry • Ts'elxweyeqw Tribe Management Limited • Seven Generations Environmental Group

Sources: AANDC 2012, AANDC 2013a, FPLM 2013, KMC 2013b, Stó:lō Nation Society 2009, Ts'elxwéyeqw Tribe Management Limited *et.al.* 2013

More details on Squiala First Nation IRs are provided in Table 5.5-36. Grass 15, an IR shared with other First Nations as described in Table 3.3-3, is crossed by the proposed pipeline corridor, and Pekw'Xe:yles, Skumalasph 16, Squiaala 7 and Squiaala 8 are located in the Socio-Economic RSA.

TABLE 5.5-36

SQUIALA FIRST NATION– RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/Socio-Economic RSA/Outside Study Area	Land Use Plans/Priorities	On-reserve Services	On-reserve Infrastructure
Grass 15	n/a[1]	n/a[1]	n/a[1]	Proposed Pipeline Corridor	Unknown[2]	Unknown[2]	Unknown[2]
Pekw'Xe:yles	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]
Skumalasph 16	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]
Squiaala 7 & 8	80	55	50%	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data could not be found in desktop research or field notes.

3 This information is not required for this IR as the IR is located beyond the proposed pipeline corridor.

Squiala First Nation is involved with the Ts'elxweyéqw Tribe, an umbrella organization that has been involved in business and government partnerships, land use planning and economic initiatives in partnership with or on behalf of the communities it represents (Ts'elxweyéqw Tribe 2013).

Key economic activities of the Squiala First Nation include those associated with the Stó:lō Nation Societyand are described in Section 5.5.1

Squiala First Nation has two partnership companies: the Eagle Land Development Limited Partnership (ELDLP) and the Ch-ihl-kway-uhk Forestry Limited Partnership (Squiala First Nation 2012). The ELDLP is a development that leases retail space to a number of companies including Walmart and Tim Hortons (Squiala First Nation 2012). The Ch-ihl-kway-uhk Forestry Limited Partnership is a partnership between the seven Ts'elxweyeqw Band member First Nation communities as well as the Kwaw-Kwaw-apilt and Skwah First Nations (Squiala First Nation 2012). Squiala First Nation has written a Comprehensive Community Plan (Squiala First Nation 2012).

Records of Aboriginal engagement for the Project indicate that Ts'elxweyeqw Tribe Management Limited provides forest management services for oversight of all aspects of forestry projects to include oversight of contractors or subcontractors; right-of-way work; road building; vegetation management; engineering consulting; biological assessments; environmental monitoring; archaeological & cultural use assessment; potentially contract site inspection services and GIS. The Seven Generations Environmental Group provides environmental management and impact assessment; regulatory applications and permitting; resource planning; water resource management; environmental and construction monitoring; biological and ecological assessments; electrofishing and fish salvage. Additionally, the Stó:lō Nation commercially fishes pink salmon in the Fraser River.

Key training and educational priorities for the community include programming funded by the SASET program (SASET 2011). More information on SASET's mandate is available in Section 5.5.2.

Squiala First Nation has a Montessori preschool and kindergarten and supports its members in pursuing education (Squiala First Nation 2012). Services and programs provided by the Stó:lō Nation Society are listed in Section 5.5.1.

In 2012, Squiala First Nation constructed a new community hall which includes a gymnasium, elders lounge, computer lab, classroom, commercial kitchen, office space and boardrooms (Squiala First Nation 2012).

Project-related issues raised by Stó:lō community members and traditional and cultural practices of the communities involved in the Indicator Report for the Integrated Cultural Assessment for the Proposed Trans Mountain Expansion Project (Ts'elxwéyeqw Tribe Management Limited et. al. 2013) are provided in Section 5.5.1.

5.5.19 Sumas First Nation

The Sumas First Nation is a Stó:lō band located close to the City of Abbotsford, BC (First Nations of British Columbia Portal 2013). There are two Sumas First Nation IRs (AANDC 2012). The main IR and location of the Band headquarters is Upper Sumas 6 (AANDC 2012).

A description of the Stó:lō asserted traditional territory is provided in Section 5.5.1.

An overview of the Sumas First Nation is provided in Table 5.5-37.

TABLE 5.5-37

SUMAS FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Unknown[1]	Stó:lō Nation	Hul'q'umi'num'/ Halq'eméylem	Winter Dance Mask Dance Regalia placement Cleansing/bathing Fasting/sweat ceremony/burning for ancestors Weaving Carving Hunting Fishing Plant gathering Trapping Drying meat Tanning hides	Band partnerships: Stó:lō Development Corporation; Stó:lō Community Futures; Stó:lō Tourism Commission forestry Economic development planning: Economic Steering Committee (5 year Economic Development Plan)

Sources: AANDC 2012, AANDC 2013a, FPLM 2013, Stó:lō Nation Society 2009, Sumas First Nation 2013, Ts'elxwéyeqw Tribe Management Limited 2013

Note: 1 Data could not be found in desktop research or field notes.

More details on Sumas First Nation IRs are provided in Table 5.5-38. None of the Sumas First Nation IRs are crossed by the proposed pipeline corridor; however, Pekw'Xe:yles and Upper Sumas 6 are located in the Socio-Economic RSA.

TABLE 5.5-38

SUMAS FIRST NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area
Pekw'Xe:yles (Peckquaylis)	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA
Upper Sumas 6	187	140	31.2%	Socio-Economic RSA

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Note: 1 Statistics Canada does not provide information for this community.

Sumas First Nation has an Economic Steering Committee, formed to develop a five-year Economic Development Plan (Sumas First Nation 2013). Economic activities of the Sumas First Nation include those associated with the Stó:lō Nation Society as described in Section 5.5.1.

The results of Aboriginal engagement for the Project indicate that the Stó:lō Nation commercially fishes pink salmon in the Fraser River.

Services and programs provided by the Stó:lō Nation Society are listed in Section 5.5.1 along with Project-related issues raised by Stó:lō community members and traditional and cultural practices of the communities involved in the Indicator Report for the Integrated Cultural Assessment for the Proposed Trans Mountain Expansion Project (Ts'elxwéyeqw Tribe Management Limited et. al. 2013).

5.5.20 Tzeachten First Nation

The Tzeachten First Nation is a Stó:lō band located in the Fraser Valley Regional District, east of the Greater Vancouver/Lower Mainland Region of BC (Tzeachten First Nation 2012). The Band is a member of the Stó:lō Nation Society, and many of Tzeachten First Nation's economic and social initiatives and services are associated with this tribal council (Stó:lō Nation Society 2009). Tzeachten First Nation is part of the Stó:lō Xwexwilmexw Treaty Association which is working through the treaty process with the BC Treaty Commission (Stó:lō Xwexwilmexw Treaty Association 2013). As of 2013, the total population of the Tzeachten First Nation was 483 people, of which 255 live on IRs and 228 live off IRs (AANDC 2013a). There are three Tzeachten IRs (AANDC 2012). Tzeachten 13 is 283.8 hectares in size and shares 64.8 additional hectares of the Grass IR with eight neighbouring First Nations (AANDC 2012, Tzeacthen First Nation 2012). Tzeachten 13 is the main IR and location of the Band headquarters (AANDC 2012, Tzeacthen First Nation 2012).

A description of the Stó:lō asserted traditional territory is provided in Section 5.5.1.

An overview of the Tzeachten First Nation is provided in Table 5.5-39.

TABLE 5.5-39

TZEACHTEN FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 483 On IRs: 255 Off IRs: 228	Stó:lō Nation Society	Halq'eméylem (upriver dialect of Halkomelem)	Winter Dance Mask Dance Regalia placement Cleansing/bathing Fasting/sweat ceremony/burning for ancestors Weaving Carving Hunting Fishing Plant gathering Trapping Drying meat Tanning hides	Band partnerships: • Stó:lō Development Corporation; • Stó:lō Community Futures; • Stó:lō Tourism Commission forestry • Ts'elxweyeqw Tribe Management Limited • Seven Generations Environmental Group

Sources: AANDC 2012, AANDC 2013a, KMC 2013b, Statistics Canada 2012, Stó:lō Nation Society 2009, Ts'elxwéyeqw Tribe Management Limited *et.al.* 2013

More details on Tzeachten First Nation IRs are provided in Table 5.5-40. Of the Tzeachten First Nation IRs, Grass 15, an IR shared with other First Nations as described in Table 3.3-3, and Tzeachten 13 are crossed by the proposed pipeline corridor while Pekw'Xe:yles is in the Socio-Economic RSA.

TABLE 5.5-40

TZEACHTEN FIRST NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area	Land Use Plans/Priorities	On-reserve Services	On-reserve Infrastructure
Grass 15	n/a[1]	n/a[1]	n/a[1]	Proposed Pipeline Corridor	Unknown[2]	Unknown[2]	Unknown[2]
Pekw'Xe:yles	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[3]	n/a[3]	n/a[3]
Tzeachten 13	1,467	1,280	6.7%	Proposed Pipeline Corridor	Unknown[2]	Unknown[2]	Unknown[2]

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data could not be found in desktop research or field notes.

3 This information is not required for this IR as the IR is located beyond the proposed pipeline corridor.

Tzeachten First Nation is involved with the Ts'elxweyéqw Tribe, an umbrella organization that has been involved in business and government partnerships, land use planning and economic initiatives in partnership with or on behalf of the communities it represents (Ts'elxweyéqw Tribe 2013).

Key training and educational priorities for the community include programming funded by the SASET program (SASET 2011). More information on SASET's mandate is available in Section 5.5.2.

Band-owned businesses include:

- Vedder Crossing Plaza, which leases space to retailers, and includes a medical clinic and a medical laboratory;
- Planet Earth Restaurant;
- Tzeachten Gas Bar;
- Bear Image Productions; and
- Vedder Station Shell.

Economic activities of the Tzeachten First Nation also include those associated with the Stó:lō Nation Society as described in Section 5.5.1.

Records of Aboriginal engagement for the Project indicate that Ts'elxweyeqw Tribe Management Limited provides forest management services for oversight of all aspects of forestry projects to include oversight of contractors or subcontractors; right-of-way work; road building; vegetation management; engineering consulting; biological assessments; environmental monitoring; archaeological and cultural use assessment; site inspection services; and GIS. The Seven Generations Environmental Group provides environmental management and impact assessment; regulatory applications and permitting; resource planning; water resource management; environmental and construction monitoring; biological and ecological assessments; electrofishing and fish salvage. Additionally, the Stó:lō Nation commercially fishes pink salmon in the Fraser River.

Tzeachten First Nation's traditional language is Halq'emeylem, and the Band's name in this language is Ch'iyaqtel, meaning fish weir (Tzeachten First Nation 2012). Traditional harvesting, particularly fishing sockeye, spring and dog salmon and eulachon for subsistence purposes, continues to be an important element of livelihood and culture for Tzeachten First Nation members (Tzeachten First Nation 2012). Members of Tzeachten First Nation can fish for the winter time and eat it fresh in season (Tzeachten First Nation 2012).

Tzeachten First Nation also has facilities available for public rental including a community hall, two board rooms, and two sports fields.

Services and programs provided by the Stó:lō Nation Society are listed in Section 5.5.1 along with Project-related issues raised by Stó:lō community members and traditional and cultural practices of the communities involved in the Indicator Report for the Integrated Cultural Assessment for the Proposed Trans Mountain Expansion Project (Ts'elxwéyeqw Tribe Management Limited et. al. 2013)..

5.5.21 Union Bar First Nations

The Union Bar First Nations is a Stó:lō band and member of the Stó:lō Nation Society (AANDC 2012). The Band is located in the Fraser Valley near the City of Hope, BC (FPLMBC 2013). As of 2013, the total population of Union Bar First Nations was 119 people, of which 10 live on IRs and 109 live off IRs (AANDC 2013a). There seven Union Bar First Nations IRs (AANDC 2012).

An overview of the Union Bar First Nations is provided in Table 5.5-41.

TABLE 5.5-41

UNION BAR FIRST NATIONS – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 119 On IRs: 10 Off IRs: 109	Stó:lō Nation Society	Halq'eméylem (upriver dialect of Halkomelem)	Unknown[1]	Band partnerships: • Stó:lō Development Corporation; • Stó:lō Community Futures; • Stó:lō Tourism Commission forestry • Seven Generations Environmental Group

Sources: AANDC 2012, AANDC 2013a, FPLM 2013, KMC 2013b, Stó:lō Nation Society 2009

Notes: 1 Data could not be found in desktop research or field notes.

More details on Union Bar First Nations IRs are provided in Table 5.5-42. The Kawkawa Lake 16, Aywawwis 15, Kawkawa Lake 16, Klaklacum 12, Puckatholetchin 11, Skawahlum 10, Swahliseah 14 and Trafalgar Flat 13 are located in the Socio-Economic RSA.

TABLE 5.5-42

UNION BAR FIRST NATIONS – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area
Kawkawa Lake 16	0	n/a[1]	n/a[1]	Socio-Economic RSA
Aywawwis 15	5	n/a[1]	n/a[1]	Socio-Economic RSA
Klaklacum 12	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA
Puckatholetchin 11	5	n/a[2]	n/a[2]	Socio-Economic RSA
Skawahlum 10	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA
Swahliseah 14	0	n/a[2]	n/a[2]	Socio-Economic RSA
Trafalgar Flat 13	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data for this area has been suppressed for data quality or confidentiality reasons.

Key economic activities of the Union Bar First Nations include those associated with the Stó:lō Nation Society as described in Section 5.5.1.

According to records of engagement, the Seven Generations Environmental Group provides environmental management and impact assessment; regulatory applications and permitting; resource planning; water resource management; environmental and construction monitoring; biological and ecological assessments; electrofishing and fish salvage. Additionally, the Stó:lō Nation commercially fishes pink salmon in the Fraser River.

5.5.22 Yakweakwioose First Nation

The Yakweakwioose First Nation (Yakweakwioose) is a Stó:lō band located near the City of Chilliwack in the Upper Fraser Valley (AANDC 2012). The band is a member of the Stó:lō Nation Society, and many of the Yakweakwioose's economic and social initiatives and services are associated with this tribal council (Stó:lō Nation Society 2009). Yakweakwioose are part of the Stó:lō Xwexwilmexw Treaty Association which is working through the treaty process with the BC Treaty Commission (Stó:lō Xwexwilmexw Treaty Association 2013). As of 2013, the total population of the Yakweakwioose was 67 people, of which 35 live on IRs and 32 live off IRs (AANDC 2013a). There are three Yakweakwioose IRs (AANDC 2012). The main IR and location of the Band headquarters is Yakweakwioose 12 (AANDC 2012).

A description of the Stó:lō asserted traditional territory is provided in Section 5.5.1.

An overview of the Yakweakwioose First Nation is provided in Table 5.5-43.

TABLE 5.5-43

YAKWEAKWIOOSE FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 67 On IRs: 35 Off IRs: 32	Stó:lō Nation Society	Halq'eméylem (upriver dialect of Halkomelem)	Winter Dance Mask Dance Regalia placement Cleansing/bathing Fasting/sweat ceremony/burning for ancestors Weaving Carving Hunting Fishing Plant gathering Trapping Drying meat Tanning hides	Band partnerships: • Stó:lō Development Corporation; • Stó:lō Community Futures; • Stó:lō Tourism Commission forestry • Ts'elxweyeqw Tribe Management Limited • Seven Generations Environmental Group

Sources: AANDC 2012, AANDC 2013a, FPLM 2013, KMC 2013b, Stó:lō Nation Society 2009, , Ts'elxwéyeqw Tribe Management Limited 2013

More details on Yakweakwioose First Nation IRs are provided in Table 5.5-44. Of the Yakweakwioose IRs, Grass 15, an IR shared with other First Nations as described in Table 3.3-3, is crossed by the proposed pipeline corridor and Pekw'Xe:yles and Yakweakwioose 12 are in the Socio-Economic RSA (AANDC 2012).

TABLE 5.5-44

YAKWEAKWIOOSE FIRST NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/Socio-Economic RSA/Outside Study Area	Land Use Plans/Priorities	On-reserve Services	On-reserve Infrastructure
Grass 15	n/a[1]	n/a[1]	n/a[1]	Proposed Pipeline Corridor	Unknown[3]	Unknown[3]	Unknown[3]
Pekw'Xe:yles	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA	n/a[4]	n/a[4]	n/a[4]
Yakweakwioose 12	39	n/a[2]	n/a[2]	Socio-Economic RSA	n/a[4]	n/a[4]	n/a[4]

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data for this area has been suppressed for data quality or confidentiality reasons.

3 Data could not be found in desktop research or field notes.

4 This information is not required for this IR as the IR is located beyond the proposed pipeline corridor.

Yakweakwioose First Nation is involved with the Ts'elxweyéqw Tribe, an umbrella organization that has been involved in business and government partnerships, land use planning and economic initiatives in partnership with or on behalf of the communities it represents (Ts'elxweyéqw Tribe 2013).

Key economic activities of the Yakweakwioose First Nation include those associated with the Stó:lō Nation Society as described in Section 5.5.1.

During Project-related engagement it was noted that Ts'elxweyeqw Tribe Management Limited provides forest management services including: contract management; right-of-way work; road building; vegetation management; engineering consulting; biological assessments; environmental monitoring; archaeological & cultural use assessment; site inspection services; and GIS. The Seven Generations Environmental Group provides services in the areas of: environmental management and impact assessment; regulatory applications and permitting; resource planning; water resource management; environmental and construction monitoring; biological and ecological assessments; electrofishing and fish salvage. Additionally, the Stó:lō Nation commercially fishes pink salmon in the Fraser River.

Services and programs provided by the Stó:lō Nation Society are listed in Section 5.5.1 along with Project-related issues raised by Stó:lō community members and traditional and cultural practices of the communities involved in the Indicator Report for the Integrated Cultural Assessment for the Proposed Trans Mountain Expansion Project (Ts'elxwéyeqw Tribe Management Limited et. al. 2013).

5.5.23 Yale First Nation

The Yale First Nation is an independent band located in proximity to the City of Hope, BC. The Yale First Nation is in the final stages of negotiating a treaty with the provincial Government of BC and federal Government of Canada (Yale First Nation 2013). As of 2013, the total population of Yale First Nation was 162 people, of which 67 live on IRs and 95 live off IRs (AANDC 2013a). There are sixteen Yale First Nation IRs (AANDC 2012). The main IR and location of the Band headquarters is Stullawheets 8 (AANDC 2012).

An overview of the Yale First Nation is provided in Table 5.5-45.

TABLE 5.5-45

YALE FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 162 On IRs: 67 Off IRs: 95	Stó:lō Nation	Hul'q'umi'num'/ Halq'eméylem	Fishing Hunting Gathering	Band and member-owned businesses: • Cascade Lower Canyon Community Forest (non-profit) • Penny's First Aid Services (ground ambulance services, non-emergency patient transportation, air ambulance repatriation, medical services; First Aid Level 3, EMT- RNs; Licensed EMR, Primary Care Paramedics, EMT - A, Advanced Care Paramedics, OFA, 4X4 ambulance, security services) • Hansen Forest Services • E&K Construction

Sources: AANDC 2012, AANDC 2013a, FPLM 2013, KMC 2013b, Yale First Nation 2013

More details on Yale First Nation IRs are provided in Table 5.5-46. None of the Yale First Nation IRs are crossed by the proposed pipeline corridor; however, 4½ Mile 2, Albert Flat 5, Kaykaip 7, Lukseetsissum 9, Qualark 4, Squeah 6, Stullawheets 8, Yale 18, Yale 19, Yale 20, Yale 21, Yale 22, Yale 23, Yale 25 and Yale Town 1 are located in the Socio-Economic RSA. Other Yale First Nation IRs are located outside the Socio-Economic RSA.

TABLE 5.5-46

YALE FIRST NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/Socio-Economic RSA/Outside Study Area
4½ Mile 2	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA
Albert Flat 5	15	n/a[2]	n/a[2]	Socio-Economic RSA
Kaykaip 7	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA
Lukseetsissum 9	21	n/a[2]	n/a[2]	Socio-Economic RSA
Qualark 4	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA
Squeah 6	n/a[1]	n/a[2]	n/a[2]	Socio-Economic RSA
Stullawheets 8	48	40	n/a[1]	Socio-Economic RSA
Yale 18	n/a[2]	n/a[1]	n/a[1]	Socio-Economic RSA
Yale 19	n/a[2]	n/a[1]	n/a[1]	Socio-Economic RSA
Yale 20	n/a[2]	n/a[1]	n/a[1]	Socio-Economic RSA
Yale 21	n/a[2]	n/a[1]	n/a[1]	Socio-Economic RSA
Yale 22	n/a[2]	n/a[1]	n/a[1]	Socio-Economic RSA
Yale 23	n/a[2]	n/a[1]	n/a[1]	Socio-Economic RSA
Yale 24	n/a[1]	n/a[1]	n/a[1]	Outside Study Area
Yale 25	n/a[2]	n/a[1]	n/a[1]	Socio-Economic RSA
Yale Town 1	10	n/a[2]	n/a[2]	Socio-Economic RSA

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data for this area has been suppressed for data quality or confidentiality reasons.

Key economic activities of the Yale First Nation include forestry and fisheries. The Yale First Nation also offers contracting for energy industry development (Yale First Nation 2013). The Yale First Nation has partnered with the District of Hope and the FVRD in creating the Cascade Lower Canyon Community Forest Corporation, a non-profit organisation that operates a community forest (Yale First Nation 2013). Key training and educational priorities for the community include programming funded by the SASET program (SASET 2011). More information on SASET's mandate is available in Section 5.5.2.

The results of Project-related Aboriginal engagement indicate that Yale First Nation members continue to fish for salmon and sometimes sturgeon for economic and subsistence purposes, but have noticed a decline in numbers over recent years. Trout, coho, sockeye and king salmon spawn in the navigable Rostin Bar Creek. Band members also continue to hunt and gather for subsistence purposes. It was noted that the Yale First Nation provides some educational and health services to Band members.

Key Project-related issues raised by Yale First Nation members during Project-related engagement include:

- concerns about pesticide use on the right-of-way; and
- concern that the Project may affect access to sacred or ceremonial sites.

5.6 Metro Vancouver Region

5.6.1 Katzie First Nation

The Katzie First Nation is an independent First Nation (MARR 2013) located near the City of Pitt Meadows, BC (Katzie First Nation 2002). As of 2013, the total population of the Katzie First Nation was 544 people, of which 316 live on IRs and 228 live off IRs (AANDC 2013a). There are five Katzie First Nation IRs (AANDC 2012). The main IR and location of the Band headquarters is Katzie 1 (AANDC 2012).

The asserted traditional territory of the Katzie First Nation includes the entire Pitt watershed and the Alouette watershed, as well as some portions of the Fraser River and lands adjacent to it as identified in formal agreements with neighbouring First Nations. Katzie IRs cover a total of 398 hectares in five different locations (Katzie First Nation 2002): one in Pitt Meadows, one in Maple Ridge, one in Langley, and two in Metro Vancouver's Electoral Area 'A' (Metro Vancouver 2012a).

An overview of the Katzie First Nation is provided in Table 5.6-1.

TABLE 5.6-1

KATZIE FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 544 On IRs: 316 Off IRs: 228	None	Hul'q'umi'num'/ Halq'eméylem/ hənqəminəm	hunting, gathering (cranberry 'agriculture' - and trade with saltwater peoples), fishing (Oolichan fishing - concern over decline)	Businesses: • Forestry ventures Band partnership: • Katzie Coast Marine (Provides transportation services, construction and equipment for projects via land and sea; BC's largest fleet of side dump trucks)

Sources: AANDC 2012, AANDC 2013a, FPLM 2013, KMC 2013b, Metro Vancouver 2012a

More details on Katzie First Nation IRs are provided in Table 5.6-2. None of the Katzie First Nation IRs are crossed by the proposed pipeline corridor; however, Bamston Island 3, Graveyard 5, Katzie 1, Katzie 2 and Pitt Lake 4 are located in the Socio-Economic RSA.

TABLE 5.6-2

KATZIE FIRST NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/Socio-Economic RSA/Outside Study Area
Barnston Island 3	n/a[2]	n/a[2]	n/a[2]	Socio-Economic RSA
Graveyard 5	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA
Katzie 1	229	170	30%	Socio-Economic RSA
Katzie 2	n/a[2]	n/a[2]	n/a[2]	Socio-Economic RSA
Pitt Lake 4	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data for this area has been suppressed for data quality or confidentiality reasons.

Key economic activities of the Katzie First Nation include forestry ventures (MARR 2013). Key training and educational priorities for the community include programming funded by the SASET program (SASET 2011). More information on SASET's mandate is available in Section 5.5.2.

5.6.2 Kwikwetlem First Nation

The Kwikwetlem First Nation (Kwikwetlem) is a Stó:lō band located on the Coquitlam River in BC (Metro Vancouver 2012a). The band is not currently involved in treaty negotiations (Metro Vancouver 2012a). As of 2013, the total population of Kwikwetlem was 82 people, of which 40 live on IRs and 42 live off IRs (AANDC 2013a). There are two Kwikwetlem IRs (AANDC 2012, Metro Vancouver 2012a). The main IR and location of the Band headquarters is Coquitlam 1, however development is planned for Coquitlam 2 in an effort to encourage members living off IRs to relocate there (Metro Vancouver 2012a).

The asserted traditional territory of Kwikwetlem is crossed by the proposed pipeline corridor. An overview of the Kwikwetlem is provided in Table 5.6-3.

TABLE 5.6-3

KWIKWETLEM FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 82 On IRs: 40 Off IRs: 42	None	Hul'q'umi'num'/ Halq'eméylem/ hənqəminəm	Unknown[1]	Unknown[1]

Sources: AANDC 2012, AANDC 2013a, FPLM 2013

Note: 1 Data could not be found in desktop research or field notes.

More details on Kwikwetlem IRs are provided in Table 5.6-4. None of the Kwikwetlem First Nation IRs are crossed by the proposed pipeline corridor; however, Coquitlam 1 and Coquitlam 2 are located in the Socio-Economic RSA (AANDC 2012).

TABLE 5.6-4

KWIKWETLEM FIRST NATION – RESERVES

IR	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/Socio-Economic RSA/Outside Study Area
Coquitlam 1	39	n/a[1]	n/a[1]	Socio-Economic RSA
Coquitlam 2	5	n/a[1]	n/a[1]	Socio-Economic RSA

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Note: 1 Data for this area has been suppressed for data quality or confidentiality reasons.

The Band has social development, post secondary education, health, infrastructure, economic development, land and resource, and operations and maintenance departments. The Band is working on the Wilson Farm Habitat Enhancement Project, which is located at the Coquitlam River estuary. They have restored tidal function and build habitat for juvenile salmon (Kwikwetlem First Nation 2012).

5.6.3 Métis Nation British Columbia

The Métis Nation of BC represents 35 Métis chartered communities in BC (Métis Nation British Columbia [MNBC] 2013). The organization's mandate includes the implementation of relevant social and economic programs and services for these communities (MNBC 2013). As of 2013, the Métis Nation represented 8,000 provincially registered Métis citizens, and a population of 69,475 self-identified Métis people (MNBC 2013).

The asserted traditional territory of Canada's Métis people encompasses the western provinces as well as the northern United States (Métis National Council 2011).

An overview of the Métis Nation BC is provided in Table 5.6-5.

TABLE 5.6-5

MÉTIS NATION BRITISH COLUMBIA – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: Unknown[1]	Métis Nation British Columbia is the umbrella organization representing the Métis Chartered Communities of British Columbia.	Michif	Social meetings, potluck dinners, Métis Jigging, music, etc.	Goals: improve employability, earning capacity and self-reliance of BC Métis people NICHE Environmental Ltd. provides the following services: Aboriginal community-based research services; land use planning and analysis; forest management and environmental sciences; land and resource inventories; GIS/database, remote sensing/digital mapping; cumulative effects issues; and traditional knowledge; Sarver Wood Fiber; Sarvair Helicopters

Sources: Chilliwack Métis Association 2013, KMC 2013b, MNBC 2013

Note: 1 Data could not be found in desktop research or field notes.

Programs and services offered through the organization include:

- the ASETS program;

- the BladeRunners program, which provides some safety tickets and technical training as well as life skills and job readiness;
- Industry engagement and partnerships; and
- the Métis Employment and Training (METP), which helps to improve the employability, earning capacity and self-reliance of BC's Métis people.

The Métis Nation BC 2006 Provincial Survey showed that 55% of respondents reported an annual household income of less than $40,000, with 23% reporting an annual household income below $20,000. Twenty-four percent of respondents were seasonally employed, 30.6% were employed part-time, and 45.4% are employed full-time for more than six months of the year. Sixteen percent are unemployed. Dental care, diabetes, elder care, mental health and addiction support, prescription assistance and traditional healing alternatives were all subject of concern to survey respondents (MNBC 2013).

5.6.4 Musqueam Indian Band

The Musqueam Indian Band is a Coast Salish band located in the southwest corner of the City of Vancouver, south of Marine Drive near the mouth of the Fraser River in BC (Metro Vancouver 2012a, Musqueam Indian Band 2011). Musqueam Indian Band is in stage four of six in treaty negotiations with the Government of BC (Metro Vancouver 2012a, Musqueam Indian Band 2011). As of 2013, the total population of Musqueam Indian Band was 1,309, of which 761 live on IRs and 548 live off IRs (Metro Vancouver 2012a). There are three Musqueam Indian Band IRs (AANDC 2012). The main IR and location of the Band headquarters is Musqueam 2. This IR is home to 771 non-Aboriginal people as well as 798 members of First Nations (Metro Vancouver 2012a, Musqueam Indian Band 2011).

Musqueam Indian Band is a signatory to the *Framework Agreement on First Nation Land Management* and has developed its own Land Code. Through bilateral negotiations with the Government of Canada, Musqueam Indian Band is currently pursuing Aboriginal Self-Governance (Metro Vancouver 2012a).

Their IRs cover a total of 254.2 hectares (Metro Vancouver 2012a).

An overview of the Musqueam Indian Band is provided in Table 5.6-6.

TABLE 5.6-6

MUSQUEAM INDIAN BAND – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 1,309 On IRs: 761 Off IRs: 548	None	Hul'q'umi'num'/ Halq'eméylem/ hənqəmінəm	Traditional crafts	Band-owned business: Shaughnessy Golf and Country Club Economic development goals: • Real estate development Marina development • Employment and Training Department

Sources: FPLM 2013, Metro Vancouver 2012a, Syncra Construction 2012

More details on Musqueam Indian Band IRs are provided in Table 5.6-7. None of the Musqueam Indian Band IRs are crossed by the proposed pipeline corridor, however, Musqueam 2, Musqueam 4 and Sea Island 3 are located in the Socio-Economic RSA.

TABLE 5.6-7

MUSQUEAM INDIAN BAND – RESERVES

IR	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area
Musqueam 2	1,569	1,325	11.8%	Socio-Economic RSA
Musqueam 4	5	n/a[2]	n/a[2]	Socio-Economic RSA
Sea Island 3	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data for this area has been suppressed for data quality or confidentiality reasons.

Key economic activities of the Musqueam Indian Band include real estate development, the development of a marina in Marpole and the ownership of the Shaughnessy Golf and Country Club (Globe and Mail 2013). The Musqueam Indian Band has an agreement with the University of British Columbia (UBC) which allows them to partner with UBC on programming and education, including the availability of a Musqueam Indian Band language course for credit, and a weekly non-credit seminar held at Musqueam Indian Band (BC 2013).

Employment and training programs are provided by Musqueam Indian Band's Employment and Training Department. The Department assists unemployed Band members achieve entry into the labour force, and identifies and monitors employment, occupational and training needs for the community. The Musqueam Community Centre in Vancouver is a newly developed 31,000 square foot recreation and office facility (Syncra Construction 2012).

Traditional crafts remain an important element of livelihood and culture for Musqueam Indian Band members (Metro Vancouver 2012a). The Band works with local organisations to ensure that their asserted traditional territory is recognised and that the public is educated on the fact that much development is taking place on their asserted traditional territory (Metro Vancouver 2012a). Incorporating Musqueam Indian Band art into local projects and providing employment for Musqueam Indian Band members are two ways in which this is accomplished (Metro Vancouver 2012a).

5.6.5 Qayqayt First Nation

The Qayqayt First Nation, formerly known as New Westminster First Nation (FPLMBC 2013), is a Kwantlen band located in the community of Whalley and the City of New Westminster (Metro Vancouver 2012a). As of 2013, the total population of Qayqayt First Nation was reported as 12 people (Metro Vancouver 2012a, AANDC 2013, The Record 2009). The Qayqayt First Nation does not have any IRs (Metro Vancouver 2012a, AANDC 2012, The Record 2009). The Qayqayt First Nation's population was decimated between 1879 and 1900 by the smallpox epidemic, and in 1916 their land was reallocated, and the remaining band members were largely assimilated into neighbouring nations, with the last Band member on record passing away in 1992 (Metro Vancouver 2012a). Chief Rhonda Larrabee discovered her family's Qayqayt First Nation heritage in the 1980s and applied for Indian status under Bill C-31 in 1994 (The Record 2009). The band now has fishing rights on the Fraser River, which they use for food, social, and ceremonial purposes (Metro Vancouver 2012a).

An overview of the Qayqayt First Nation is provided in Table 5.6-8.

TABLE 5.6-8

QAYQAYT FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 12 On IRs: 0 Off IRs: 12	None	Hul'q'umi'num'/ Halq'eméylem/ hənqəminəm	Fishing	Unknown[1]

Sources: AANDC 2012, AANDC 2013b, FPLM 2013, The Record 2009
Notes: 1 Data could not be found in desktop research or field notes.

Qayqayt First Nation does not have any IRs or official land at this time.

5.6.6 Semiahmoo First Nation

The Semiahmoo First Nation is a Coast Salish band located in the City of Surrey, BC, and is affiliated with the Sencoten Alliance of First Nations (Metro Vancouver, 2012). Semiahmoo is not involved in treaty negotiations (Metro Vancouver 2012a). As of 2013, the total population of Semiahmoo was 87 people, of which 56 live on IRs and 31 live off IRs (AANDC 2013a). There is one Semiahmoo IR (AANDC 2012).

An overview of Semiahmoo First Nation is provided in Table 5.6-9.

TABLE 5.6-9

SEMIAHMOO FIRST NATION – OVERVIEW

Band Population	Tribal or Treaty Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
87	Sencoten Alliance of First Nations	Unknown[1]	Unknown[1]	Unknown[1]

Sources: AANDC 2013a, Metro Vancouver 2012a

Notes: 1 Data could not be found in desktop research or field notes.

More details on Semiahmoo First Nation's IRs are provided in Table 5.6-10. The Semiahmoo IR is not crossed by the proposed pipeline corridor; however, it is located in the Socio-Economic RSA (AANDC 2012).

TABLE 5.6-10

SEMIAHMOO FIRST NATION - RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area
Semiahmoo	108	100	n/a[1]	Socio-Economic RSA

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Data for this area has been suppressed for data quality or confidentiality reasons and/or rounded to zero.

The Traditional Land and Resource Use Technical Report of Volume 5D provides further information on Semiahmoo Nation's traditional land and resource use and cultural practices.

5.6.7 Squamish Nation

The Squamish Nation is a Coast Salish band located in Metro Vancouver and the Squamish Valley (Metro Vancouver 2012a). As of 2013, the total population of the Squamish Nation was 4,062 people, of which 3,510 live on IRs and 1,652 live off IRs (AANDC 2013a) making the Squamish the largest First Nation in Metro Vancouver (Metro Vancouver 2012a). There are 23 Squamish IRs (AANDC 2012). The main IRs are the Mission, Capilano and Seymour IRs located in Metro Vancouver (Metro Vancouver 2012a). Band headquarters are located on the Seymour IR (Squamish Nation 2008). The Squamish Nation is in Stage three of six of the Treaty Process (BC Treaty Commission 2009).

The asserted traditional territory of the Squamish Nation is located on the Lower Mainland of BC, and extends from Point Grey in the south to Roberts Creek in the west, north to the Elaho River headwaters (including all of the islands in Howe Sound and the entire Squamish valley and Howe Sound watershed), then southeast to the confluence of the Soo and Green Rivers north of Whistler, and south down to the Port Moody area (including the entire Mamquam River and Indian Arm watersheds), and finally west out to Point Grey (Squamish Nation 2001, 2008). The Squamish Nation's asserted traditional territory covers a land base of approximately 673,540 hectares (Squamish Nation 2001). It includes the Cities of Vancouver, Burnaby, New Westminster, North Vancouver, West Vancouver, Port Moody and all of the District of Squamish and the Municipality of Whistler. Howe Sound, Burrard Inlet and English Bay as well as the rivers and creeks that flow into these were also part of the Squamish Traditional Territory (Squamish Nation 2008). The Squamish Nation has a Xay Temixw (Sacred Land) Land Use Plan which was written with the intention of protecting and managing the Nation's land for the benefit of existing and future generations (Squamish Nation 2008). The Plan defines a Forest Stewardship Zone, sensitive areas, restoration areas, and Kwa kwayx welh-aynexws (Wild Spirit Places), as well as economic development priorities (Squamish Nation 2008).

An overview of the Squamish First Nation is provided in Table 5.6-11.

TABLE 5.6-11

SQUAMISH NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 4,062 On IRs:3,510 Off IRs:1,652	None	Squamish	Traditional crafts	Band-owned businesses: seventy leases including marina, driving range and gas bar. • Economic development goals: education and training in resource management • meaningful employment

Sources: AANDC 2012, AANDC 2013a, Squamish Nation 2008, Statistics Canada 2012

Notes: Certain information was sourced from Aboriginal community participation in Project-specific biophysical field studies and/or socio-economic interviews.

More details on Squamish Nation IRs are provided in Table 5.6-12. All Squamish Nation IRs are located outside the study area.

TABLE 5.6-12

SQUAMISH NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area
Aiwucks 15	n/a[1]	n/a[1]	n/a[1]	Outside study area
Capilano 5	2700	2355	10.5%	Outside study area
Cheakamus 11	56	50	n/a[1]	Outside study area
Chekwelp 26	n/a[2]	n/a[2]	n/a[2]	Outside study area
Chekwelp 26A	n/a[1]	n/a[1]	n/a[1]	Outside study area
Chuckchuck 8	n/a[1]	n/a[1]	n/a[1]	Outside study area
Defence Island 28	n/a[1]	n/a[1]	n/a[1]	Outside study area
Kaikalahun 25	n/a[1]	n/a[1]	n/a[1]	Outside study area
Kitsilano No. 6	n/a[1]	n/a[1]	n/a[1]	Outside study area
Kowtain 17	37	n/a[1]	n/a[1]	Outside study area
Kwum Kwum	n/a[1]	n/a[1]	n/a[1]	Outside study area
Mission 1	574	505	22.0%	Outside study area
Poquiosin & Skamain 13	n/a[1]	n/a[1]	n/a[1]	Outside study area
Poyam 9	n/a[1]	n/a[1]	n/a[1]	Outside study area
Schaltuuch 27	n/a[1]	n/a[1]	n/a[1]	Outside study area
Seaichem 16	53	50	n/a[1]	Outside study area
Seymour Creek 2	107	75	22.2%	Outside study area
Skowishin 7	n/a[1]	n/a[1]	n/a[1]	Outside study area
Skowishin Graveyard 10	n/a[1]	n/a[1]	n/a[1]	Outside study area
Stawamus 24	97	80	18.2%	Outside study area
Waiwakum 14	111	95	25.0%	Outside study area
Yekwaupsum 18	23	n/a[2]	n/a[2]	Outside study area
Yekwaupsum 19	n/a[1]	n/a[1]	n/a[1]	Outside study area
Yookwitz 12	n/a[1]	n/a[1]	n/a[1]	Outside study area

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Notes: 1 Statistics Canada does not provide information for this community.

2 Data for this area has been suppressed for data quality or confidentiality reasons.

Key economic activities of the Squamish Nation include 70 leases and several Band-owned businesses, including a marina, driving range and gas bar (Squamish Nation 2008). Important leases include the Park Royal Shopping Centre, International Plaza, Greater Vancouver Storage Sewage Plant and the Capilano Trailer Park. Economic development goals of the Squamish Nation include developing meaningful employment for the many unemployed and impoverished Squamish Band members, and joint ventures in tourism and forestry are to be pursued (Squamish Nation 2001). The Xay Temixw First Draft Land Use Plan (2001) states that education and training should be a high priority for the Nation, specifically in resource management and the forest industry. Job sustainability is noted as a priority, and ecotourism, greenhouses, water bottling, growing hemp and a film studio are all suggested as possible enterprises for the Squamish Nation (Squamish Nation 2001). The Squamish Nation's Draft Land Use Plan (2001) also states that baseline information and monitoring of watersheds, fish habitat, trail impact, recreation impact, logging impact and highway widening impact is required. The Squamish would like to conduct archaeological, traditional use and land occupancy studies for educational and treaty negotiation purposes (Squamish Nation 2001). The Capilano Master Plan Summary was finalized in December 2004 (Squamish Nation 2004). It includes guidelines for long-term land development on the IR including a transitional phase and an overall transportation plan (Squamish Nation 2004). The plan proposes economic development for about 40% of Capilano IR lands, such as high-rise apartment buildings and low-rise apartment and condominium complexes or townhomes (Squamish Nation 2004). New commercial and industrial development is not anticipated (Squamish Nation 2004).

Traditional crafts, such as carving (Squamish Nation 2008), continue to be an important element of livelihood and culture for Squamish First Nation members.

Services and departments of the Squamish Nation include (Squamish Nation 2008):

- Ayas Men Child and Family Services;
- Communications and Band Manager Services;
- Community Operations;
- Council Advisory and Support;
- Education – Skwxwu7mesh Uxwumixw Ns7eyxnitm ta Snewyalh (support for preschool, elementary and secondary schools, adult basic education, occupational training and special needs assessment, counseling, community outreach);
- Employment and Training – Stitsma Employment, Eslh7an Learning Centre and Squamish Nation Trades Centre;
- Finance;
- Yuustway Health Services;
- Housing and Capital Projects;
- Chen Chen Stway Human Resources;
- Information Technology;
- Intergovernmental Relations, Natural Resources and Revenue;
- Land Management;
- Registry (Land and Membership);
- Recreation; and
- Squamish Nation Trust.

5.6.8 Tsawwassen First Nation

The Tsawwassen First Nation is a Coast Salish band located between North Tsawwassen Drive and the sea in the District Municipality of Delta, BC (Metro Vancouver 2012a, Tsawwassen First Nation 2009). As of 2012, the total population of Tsawwassen First Nation was 332 people, of which 183 live on what were IR lands prior to the finalisation of the Tsawwassen First Nation Final Agreement (Treaty) (Metro Vancouver 2012a). Tsawwassen First Nation is unique in that they have signed a treaty allowing them self-government powers including responsibility for land and resource management (Tsawwassen First Nation 2009). Tsawwassen owns the land and functions much like a municipality in that the Band is responsible for planning and regulating its own lands (Tsawwassen First Nation 2009). There was formerly one Tsawwassen First Nation IR, which is now owned by the Tsawwassen First Nation (Tsawwassen First Nation 2009). Tsawwassen First Nation is now a full member of Metro Vancouver Regional District (Metro Vancouver 2012a). Band headquarters are located in the community of Tsawwassen, BC.

The Tsawwassen First Nation owns 290 hectares of land on what was formerly the Tsawwassen IR and 372 hectares of what was formerly provincial Crown land (AANDC 2010). The asserted traditional territory

of Tsawwassen extends from the watersheds feeding into Pitt Lake in the northeast, down the Pitt River to Pitt Meadows where it feeds into the Fraser River (Tsawwassen First Nation 2009). The territory includes Burns Bog and part of New Westminster following the outflow of the river just south of Sea Island (Tsawwassen First Nation 2009).

An overview of the Tsawwassen First Nation is provided in Table 5.6-13.

TABLE 5.6-13

TSAWWASSEN FIRST NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/Business Capacity
Total: 332 On Tsawwassen lands: 183 Off Tsawwassen lands: 149	None	Hul'q'umi'num'/ Halq'eméylem/ hənqəminəm	Fishing, canoeing	Band economic activity: Market housing initiatives Band partnerships: • SPAL Constructors (marine & civil works facilities construction; excavation; foundation technologies; road building; modular construction; environmental services; asphalt production; occupational health and safety & industrial hygiene; condominium construction.); • TFN Matcon Civil Joint Venture • Indigena Solutions (IT services)

Sources: FNLM 2013, Metro Vancouver 2012a, KMC 2013b

More details on the Tsawwassen community are provided in Table 5.6-14. The Tsawwassen community is located in the Socio-Economic RSA.

TABLE 5.6-14

TSAWWASSEN FIRST NATION – COMMUNITIES

Tsawwassen Community	Community Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area
Tsawwassen	720	635	9.7%	Socio-Economic RSA

Sources: AANDC 2010, Statistics Canada 2012, Statistics Canada 2013a

Note: Tsawwassen does not have any IRs. They own their land, as per a treaty signed with the Crown in 2009 (Tsawwassen First Nation 2007, 2009, 2011).

Key economic activities of the Tsawwassen First Nation include market housing initiatives based on a 99-year lease, with Tsawwassen having taxation authority; Splashodown Park, F440 Kart Racing Track; Tsatsu Gas; Park 'N Go, catering businesses, contracting, gifts and personal services. Some businesses are member-owned while others are owned by the Tsawwassen First Nation government, and the remainder are owned by non-members on land leased by Tsawwassen First Nation (Tsawwassen First Nation 2009).

Fishing is still an important element of livelihood and culture for Tsawwassen First Nation members. Sockeye, chinook, coho, chum and pink salmon are all fished for consumption and social and ceremonial use. Sockeye, chum and pink salmon are also fished commercially by the Tsawwassen First Nation (Tsawwassen First Nation 2007). SPAL Constructors is a construction project management company owned in partnership with the Tsleil-Waututh First Nation (Tsleil-Waututh Nation 2013).

Tsawwassen First Nation has the following facilities:

- an Elders' Centre;
- a Youth Centre;
- a Longhouse;
- a Recreation Centre; and
- an Early Childhood Development Centre.

5.6.9 Tsleil-Waututh Nation

The Tsleil-Waututh Nation is a Coast Salish band located near the Indian Arm fjord on the north shore of Burrard Inlet, and is in stage four of six in the treaty negotiation process with the Government of BC (Tsleil-Waututh Nation 2013, BC Treaty Commission 2009, Metro Vancouver 2012a). The community is centred at Burrard Inlet between Maplewood Flats and Deep Cove in North Vancouver, and the Band's asserted traditional territory encompasses Mount Garibaldi, Coquitlam Lake, Howe Sound and the Fraser River (Tsleil-Waututh Nation 2013). Today this asserted traditional territory is dominated by a densely urbanized area, which presents a unique challenge for the treaty process between the Tsleil-Waututh Nation and the Government of BC, something that the Tsleil-Waututh Nation's Treaty, Lands and Resources Department is working on (Tsleil-Waututh Nation 2013). The Tsleil-Waututh Nation is actively interested in participating in all aspects of the planning and development processes occurring within their asserted traditional territory, with an interest in protecting resources and ensuring sustainable development (Tsleil-Waututh Nation 2013).

As of 2013, the total population of Tsleil-Waututh Nation was 550 people, of which 317 live on IRs and 233 live off IRs (AANDC 2013a). There are three Tsleil-Waututh Nation IRs (AANDC 2012). The main IR and location of the Band headquarters is Burrard Inlet 3 which is located approximately three km east of the Second Narrows Bridge in North Vancouver (AANDC 2012, Tsleil-Waututh Nation 2013, Metro Vancouver 2012a).

The asserted traditional territory of Tsleil-Waututh Nation covers a land base of approximately 186,500 hectares (Tsleil-Waututh Nation 2013). An overview of the Tsleil-Waututh Nation is provided in Table 5.6-15.

TABLE 5.6-15

TSLEIL-WAUTUTH NATION – OVERVIEW

Band Population	Tribal Affiliation	Traditional Language	Traditional Cultural Practices	Economic Development Goals/ Business Capacity
Total: 550 On IRs: 317 Off IRs: 233	Naut'sa Mawt Tribal Council	Hul'q'umi'num'/ Halq'eméylem/ hənqəminəm	Fishing Hunting Gathering	Band-owned businesses and partnerships: Inlailawatash Forestry Limited Partnership Takaya Developments Takaya Tours TWN Wind Power Takaya Golf Centre Burrard General Store SPAL Constructors (marine & civil works facilities construction; excavation; foundation technologies; road building; modular construction; environmental services; asphalt production; occupational health and safety & industrial hygiene; condominium construction.) Economic development goals: Resource protection Sustainable development

Sources: AANDC 2012, AANDC 2013a, FPLM 2013, KMC 2013b, Tsleil-Waututh Nation 2013

More details on Tsleil-Waututh Nation IRs are provided in Table 5.6-16. None of the Tsleil-Waututh Nation IRs are crossed by the proposed pipeline corridor; however, Burrard Inlet 3 and Inlailawatash 4A are located in the Socio-Economic RSA. The remaining Tsleil-Waututh Nation IRs are located outside the Socio-Economic RSA.

TABLE 5.6-16

TSLEIL-WAUTUTH NATION – RESERVES

IRs	IR Population	Size of Labour Force (No.)	Unemployment Rate (%)	Location in Relation to Project: Proposed Pipeline Corridor/ Socio-Economic RSA/ Outside Study Area
Burrard Inlet 3	1,472	1,310	7.0%	Socio-Economic RSA
Inlailawatash 4	n/a[1]	n/a[1]	n/a[1]	Outside Study Area
Inlailawatash 4A	n/a[1]	n/a[1]	n/a[1]	Socio-Economic RSA

Sources: AANDC 2012, Statistics Canada 2012, Statistics Canada 2013a

Note: 1 Statistics Canada does not provide information for this community.

Tsleil-Waututh Nation's main economic activities are associated primarily with tourism and forestry (Tsleil-Waututh Nation 2013). There are several member-owned companies and joint business ventures which include recreational facilities, real estate endeavors, a forestry company and a cultural tourism operation (Tsleil-Waututh Nation 2013). These businesses include (Tsleil-Waututh Nation 2013):

- Takaya Developments (real estate);
- Takaya Tours (cultural tourism: canoe and kayak rentals, lessons, tours, nature walks);
- TWN Wind Power (small and community wind turbine distributor);
- Takaya Golf Centre;
- Burrard General Store;
- SPAL Constructors (a construction project management company owned in partnership with Tsawwassen First Nation); and
- Inlailawatash Forestry Limited Partnership.

Tsleil-Waututh Nation is working towards active project partnership with an additional ten identified established companies and has also partnered with government and public service agencies signing maintenance and management agreements for several Provincial Parks within their territory (Tsleil-Waututh Nation 2013).

The Tsleil-Waututh Nation's Economic Development Department is responsible for overseeing Tsleil-Waututh Nation businesses, policy-making and reporting, applying for government grants, developing and managing initiatives for the community and maintaining annual budgets (Tsleil-Waututh Nation 2013). Economic development goals of Tsleil-Waututh Nation broadly include developing a strong community by building business opportunities that enable independence (Tsleil-Waututh Nation 2013). The Tsleil-Waututh Nation is a signatory First Nation to the *Framework Agreement on First Nation Land Management* (Metro Vancouver 2012a).

Traditional harvesting of the Tsleil-Waututh Nation included hunting, plant gathering, fishing and preserving foods (Tsleil-Waututh Nation 2013). Berries, salmon, seafood, and other fish made up a large

part of the Tsleil-Waututh Nation's diet (Tsleil-Waututh Nation 2013). The Tsleil-Waututh Nation collaborated and traded with neighbouring Coast-Salish groups during the salmon harvest (Tsleil-Waututh Nation 2013). Traditional activities included wood carving, blanket weaving, and spiritual ceremonies (Tsleil-Waututh Nation 2013). Members also use the Burrard Inlet for salmon fishing (see the Traditional Marine Resource Use – Marine Transportation Technical Report in Volume 8B).

The Tsleil-Waututh Nation provides the following programs and services to its members (Tsleil-Waututh Nation 2013):

- Community Centre;
- elders programs (trips, events, health and wellness, etc.);
- Food Fish Program (fishing and providing fresh, canned, smoked and frozen traditionally harvest species to band members);
- health (holistic health care incorporating traditional and modern medicine);
- Child and Family Development Centre (childcare, parent night, HIPPY literacy program for preschoolers and their families, Aboriginal Infant Development Program, Aboriginal Head Start Program, Special Needs Support); and
- Skills Development Centre which provides the following:
  - Aboriginal Employment and Training Programs;
  - Band School: Kindergarten to Grade 12 courses;
  - Post-secondary education support (Tsleil-Waututh Nation has a partnership with three schools a handful of other First Nations);
  - Homework club;
  - Training Programs (*e.g.,* warehouse and supply chain career training, cook and chef career training); and
  - Youth Interns.

6.0 EXISTING CONDITIONS – SOCIAL AND CULTURAL WELL-BEING

The sense of social and cultural well-being of a community or region is dynamic and influenced by multiple factors and may be experienced differently by different people. Because of the dynamic, multi-faceted and individual nature of social and cultural well-being, pinpointing indicators of social and cultural well-being is challenging and indicators are often highly qualitative.

Many issues related to other biophysical and socio-economic elements (*e.g.,* human health risk, air emissions, acoustic environment, water quality and quantity, employment and economy, infrastructure and services) potentially affect the general sense of well-being at a community level. This subsection, however, focuses on factors related to social and cultural well-being not captured elsewhere. For the purposes of this assessment, the social and cultural well-being is described in terms of:

- population and demographics;
- income levels and distribution;
- Aboriginal culture; and
- community way-of-life, including key community events, community assets and built features, crime rates and any identifiable and social issues, trends, and community priorities.

Community health and well-being is discussed in further detail in the Community Health Technical Report in Volume 5B.

For each socio-economic region of the Project, an overview is presented focusing on the above factors, followed by high-level overviews of each study area community. High-level overviews of specified unincorporated communities crossed by the route are also presented. Aboriginal Community Profiles are presented in Section 5.0 of this report.

The proposed pipeline corridor will cross a portion of east-central Alberta and the entire width of BC. The proposed pipeline corridor crosses 18 incorporated municipalities, 7 or regional districts (including Metro Vancouver or the GVRD), and 10 IRs across Alberta and BC. In 2011, the Socio-Economic RSA as a whole had a population of over 3.9 million (see Tables A-1 and A-2 of Appendix A). There is great diversity in the population characteristics of the communities and regions crossed by the Project. Communities range from small hamlets, villages and IRs to moderately sized towns and cities to large urban centres.

There is variability in income levels across the Socio-Economic RSA. In 2011, the median income of the adult population (aged 15 and over) on a regional basis varied from a low of approximately $23,400 in the Fraser Valley Region to a high of approximately $39,800 in the Edmonton Region (Tables A-5 and A-6 of Appendix A). For adults working full-year and full-time in 2011, median income ranged from a low of approximately $45,700 in the Fraser Valley Region to a high of approximately $59,000 in the Rural Alberta Region (Tables A-5 and A-6 of Appendix A).

Aboriginal people living both on and off reserve represent a unique demographic in the Socio-Economic Region. Across the Socio-Economic RSA, approximately 4.0% of the population is of Aboriginal identity (based on 2011 data). On a regional basis, the percentage of the population that identifies as Aboriginal varies from a low of 2.2% in the Jasper National Park Region to a high of 11.5% in the Rural Alberta Region (Tables A-1 and A-2 of Appendix A).

Labour force information is discussed in Section 10.0, Employment and Economy.

6.1 Edmonton Region

6.1.1 Regional Overview

6.1.1.1 Population and Demographics

The Edmonton Region contains the Edmonton Metropolitan Area (which includes the City of Edmonton and numerous surrounding cities, towns, villages, IRs and regions) and select other surrounding communities and regions that could provide labour or services to the Project in the Edmonton area. In 2011, the total population of the Edmonton Region was approximately 1.2 million an 11.8% increase from 2006. Approximately 68% of the population of the Edmonton Region in 2011 resided in the City of Edmonton. Table A-1 in Appendix A summarizes select population characteristics for municipalities, counties/regions and IRs in the region. In the Edmonton Region in 2011, approximately 5.5 % of the population identified as Aboriginal. There are several IRs and Aboriginal communities in this region; however, no IRs are crossed by the proposed pipeline corridor.

In 2011, population mobility in the Edmonton Region varied depending on the community. Population mobility refers to people moving their place of residence over a period of time (either within a community, or from another place), and can have implications for community services and culture. It can also be an indication of labour mobility. Internal migrants refers to people who moved to a different city, town, village or IR but from within Canada. Internal migrants are then either intraprovincial (moving from within the same province) or interprovincial (moving from another province or territory within Canada). Across the Edmonton Region, the Summer Village of West Cove had the highest percentage of internal migrants between 2009 and 2011, (33.3 % of the total mobility population, all of which were intraprovincial). In the City of Edmonton, approximately 3.5% of the population were internal migrants; 2.0% moving from within Alberta and 1.5% moving from another province or territory within Canada. The City of Spruce Grove and Town of Stony plan had a higher proportion of internal migrants than the City of Edmonton in 2011, at 8.7% and 8.1% respectively. Table A-3 in Appendix A summarizes select population mobility characteristics for communities in the region.

A shadow population is defined as the temporary population living in an area for certain times of the year, but who have a permanent residence elsewhere. Shadow population members may reside in project accommodations, hotels and motels, and campgrounds or in private or rental accommodations. Shadow population members can present local governance issues since they use local services and infrastructure in the municipality where they temporarily reside without contributing to the municipal tax base. Summer villages in the Edmonton Region have a large shadow population as a result of the influx of individuals during the summer months.

The percentage of private dwellings occupied by usual (permanent) residents compared to the total number of private dwellings can be an indication of the presence of a shadow population. The Edmonton Region has a highly variable shadow population ranging from high in summer villages, to low in the City of Edmonton. The average percentage of private dwellings occupied by permanent residents in the City of Edmonton was 93.1%, compared to 92.4% for the Province of Alberta (Table A-1 in Appendix A.), indicating a low shadow population. Summer villages, by contrast, indicate a high shadow population, with the number of private dwellings occupied by permanent residents in most Summer villages being fewer than 50%. Overall, communities in this region vary greatly in the number of private dwellings occupied by permanent residents, ranging from 13.0% in the Summer Village of Nakamun Park to 97.9% in the City of St. Albert. Other key services centres along the proposed pipeline corridor in the region are the Town of Stony Plain and City of Spruce Grove, which had private dwellings occupied by permanent residents of 93.8% and 95.2% respectively in 2011. A shadow population is known to fluctuate, and the average percentage of private dwellings occupied by permanent residents does not account for the shadow population present in temporary accommodations. Section 8.4.1 provides information on housing (temporary and permanent accommodations) in the Edmonton Region.

The population in the Edmonton Region is projected to continue to grow. While available information on population projections in Alberta are based on census divisions (CD), the boundaries of which do not directly mirror those of the Socio-Economic RSA as described in this report, they are still indicative of

anticipated trends for the study region. For example, in 2011, the total population of CD11 - which includes all communities in Edmonton, Parkland County, Brazeau County, the County of Wetaskiwin, Leduc County, Strathcona County and Sturgeon County — was 1,238,756. The projected population for CD11 in 2041 is 2,012,310, a growth of 38%. Yearly projections for CD11 are not available. The urbanization process is expected to continue, with the population of the Edmonton census division being expected to grow faster than the provincial average (Alberta Treasury Board and Finance 2012).

Within the Edmonton Region, the City of Spruce Grove has experienced the fastest population growth rate (34.1% from 2006 to 2011) of the communities and regions crossed by the proposed pipeline corridor. Growth in the City of Spruce Grove is attributed to regional economic growth, a low cost of living, as well as an updated transportation system that has resulted in decreased driving times to the City of Edmonton (Irving pers. comm.).

6.1.1.2 Income Levels and Distribution

In 2011, the median income for the Edmonton Region was approximately $39,800. The median income ranged from a low of $11,068 in the Alexis 133 IR to $48,149 in the Town of Gibbons. Gender differentials in income varied amongst communities in the Edmonton Region. The median income for males in the Edmonton Region was $55,382, compared to $26,654 for females. In 2011, the median income of those working full-year, full-time and with employment income across the region was approximately $57,500 for the Edmonton Region. It ranged from $30,263 in Alexis 133 to $67,990 in the City of St. Albert (Statistics Canada 2013a).

In 2011, Alexis 133 had the highest government transfer as a percent of income (39.3%) and the Town of Beaumont had the lowest (5.2%). Government transfer refers to all cash benefits received from the federal, provincial, territorial or municipal governments (*e.g.,* Old Age Security, Employment Insurance).

Table A-5 in Appendix A summarizes select income characteristics for municipalities, rural areas and IRs in the region.

6.1.1.3 Aboriginal Culture

Aboriginal people living both on and off IR represent a unique demographic in the Edmonton Region. The Edmonton Region includes six IRs, and nine Aboriginal communities located in the region may potentially be affected by the Project (asserted traditional territories of potentially affected Aboriginal communities may be crossed by more than more than one socio-economic region). People of Aboriginal identity represent 5.5% of the population in the Edmonton Region (Statistics Canada 2013a).

Key traditional land uses in the region include hunting, fishing, trapping, gathering (food and medicinal plants, plants used for traditional crafts) and the ceremonial use or maintenance of spiritual sites as well as production of traditional crafts, regalia, games and instruments. Bands conduct pow-wows and sweat lodges. These traditional practices are carried out today for both cultural and subsistence purposes. It is key to note that traditional harvesting should not only be interpreted as a means of subsistence or livelihood. It involves a sense of being in harmony with the land and the animal, and a sense of independence and dignity to the harvester. In many Aboriginal communities, it is a factor in the transmission of traditional culture and language, as much is learned culturally through working on the land during harvesting activities.

Aboriginal communities in the region also contribute to local industry, working as contractors and business owners in oil and gas, forestry and development. Communities have indicated an interest in training and work experience in these industries. Unemployment rates for IRs in the region range from moderately low to high (Statistics Canada 2013a). Generally, barriers to employment noted during engagement include lack of transportation, lack of training, language, and mental and physical health issues.

Given the high level of urbanization and the history of development in the region, there is a relatively high degree of social and economic integration between Aboriginal and non-Aboriginal populations in some

areas of the region. The relatively low levels of the use of Aboriginal language by those of Aboriginal identity reflect this integration. For example, in the Edmonton Metropolitan Area in 2006, approximately 7.0% of the Aboriginal identity population indicated that an Aboriginal language was their mother tongue and approximately 1.4% indicated that the language spoken most often at home was an Aboriginal language (Statistics Canada 2007). Use and knowledge of Aboriginal languages tends to be higher on-reserve.

Detailed overviews and a list of Aboriginal Communities within the Edmonton Region are found in Section 5.0 and in the Traditional Land and Resource Use Technical Report of Volume 5D.

6.1.1.4 Community Way of Life

Generally, the Edmonton Region includes a range of communities from larger urban centres such as the City of Edmonton, to smaller communities such as the Village of Wabamun and various unincorporated hamlets such as Entwistle and Gainford (which are crossed by the proposed pipeline corridor). There are numerous summer villages in the Edmonton Region such as Sunrise Beach, Betula Beach and Seba Beach. Summer villages are small settlements with populations that tend to be less than 300 people that historically were mainly active in the summer and where most residents were seasonal. Such smaller communities, including the Village of Wabamun, experience seasonal increases in population that are based on summer tourism.

Given the high level of industrial activity in the Edmonton area, various communities in the region have experienced major projects. The proposed pipeline corridor is located in the TUC for approximately 90% of the length through the City of Edmonton, which will minimize interference with community use areas. Communities west of Edmonton, including the City of Spruce Grove, the Town of Stony Plain and the Village of Wabamun, are very environmentally conscious and have an increased sensitivity to environmental issues as a result of the 2005 CN rail oil spill in Wabamun (Frostad, Hannah pers. comm.). The City of Spruce Grove and the Town of Stony Plain have experienced large population growth in recent years, as a result of their proximity to the City of Edmonton and diversifying economies.

The Edmonton Social Plan consists of a collection of reports focusing on neighbourhoods, population, social needs and issues. Priority social issues for the city identified in the reports' topics include children, crime and victimization, families, people with disabilities, youth and young adults and new Canadians and Visible Minorities. The City of Edmonton has a range of initiatives, services, and programs aimed at the prevention of crime (City of Edmonton 2006).

Table 6.1-1 provides information on crime rates for key police service areas in the Edmonton Region, calculated based on incidents per 1,000 people. In the City of Edmonton municipal police service area, rates of violent crime decreased approximately 8% between 2007 and 2012, and rates of property crime violations decreased by approximately 46%. Drug violations for municipal areas serviced by the Edmonton police service increased by approximately 21% during this period. In terms of drug violation rates across the Edmonton Region in 2012, the rate of incidence of was highest in municipal areas serviced by the Spruce Grove RCMP (4.1 violations per 1,000 people); however the rate of drug violations in this service area declined by approximately 5% during the 2007 to 2012 period (Table 6.1-1). In all police service areas other than Edmonton municipal and Spruce Grove municipal, drug violation rates declined between 2007 and 2012.

Key community events and assets that have been identified in the region that could interface with the Project include the following.

- In Strathcona County, land crossed by the proposed pipeline corridor is used for recreation activities (approximately RK 4.0 to RK 5.0). Facilities include a rugby field and a dog-training facility at RK 5.5.

Key socio-cultural interests and issues in the region that have been identified by stakeholders related to the Project include the following.

- Opportunities to use the right-of-way, particularly in the TUC, for recreational purposes (*e.g.,* walking, cross-country skiing, snowmobiling, community gardening).
- Opportunities for local businesses, workers, and contractors.
- Construction-related noise and traffic congestion.
- Presence of temporary construction workers in smaller centres and the potential for social issues and strain on community services.
- Protection of land, vegetation, watercourses, and wildlife used for traditional Aboriginal livelihood and cultural purposes.

TABLE 6.1-1

CRIME RATES, EDMONTON REGION, 2007 TO 2012

Police Service Area	Rate per 1,000 people														
	Total Violent Criminal Code Violations			Total Property Crime Violations			Total Other Criminal Code Violations (Excluding Traffic)			Total Criminal Code Traffic Violations			Total Drug Violations		
	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change
Edmonton, municipal	13.1	12.1	-7.6%	72.9	39.5	-45.8%	12.2	17.2	41.0%	3.9	3.6	-7.7%	1.4	1.7	21.4%
Spruce Grove, RCMP, municipal	20.6	15.4	-25.2%	91.0	67.4	-25.9%	31.2	25.5	-18.3%	6.9	9.0	30.4%	3.9	4.1	5.1%
Stony Plain, RCMP, municipal	14.1	16.3	15.6%	53.9	51.3	-4.8%	16.9	23.8	40.8%	8.9	6.5	-27.0%	4.2	3.6	-14.3%
Stony Plain RCMP, rural	97.6	67.1	-31.3%	52.1	34.6	-33.6%	17.5	14.6	-16.6%	10.1	4.9	-51.5%	6.5	3.3	-49.2%
Strathcona County, RCMP, rural	5.7	5.4	-5.3%	17.8	22.9	28.7%	2.6	4.7	80.8%	4.9	4.2	-14.3%	3.5	2.8	-20.0%

Source: Statistics Canada 2013c

Note: Some detachments report data for municipal and rural areas separately. Statistics Canada did not show data for some police service areas.

6.1.2 Communities and Regions in the Project Footprint

This subsection presents information on communities and regions in the Project Footprint of the Edmonton Region. Selected population, mobility and income statistics are located in Tables A-1, A-3 and A-5 in Appendix A.

Strathcona County

The proposed pipeline corridor crosses Strathcona County for 12.2 km (RK 0.0 to RK 12.2). The Edmonton Terminal is located in the Strathcona County (RK 0.0). Sherwood Park is the major service centre in Strathcona County. There are eight hamlets located within Strathcona County.

The Strathcona County MDP requires new pipelines to follow existing corridors, quarter sections or rights-of-way and requires that new or expanded pipelines do not impact Medium or High Priority Environment Management Areas (Strathcona County 2007).

The county's economic base is oil and gas, specifically refineries (Strathcona County 2013). Other key economic activities in Strathcona County include retail facilities and small industries (Alberta Community Profiles 2013). According to the Strathcona County MDP, conservation of the natural environment and agricultural lands are key considerations to development decisions within the county. Industrial and commercial development as well as promotion of business are also key priorities (Strathcona County 2007).

In 2011, the population of Strathcona County was 92,490 which is a 12.1% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 19.4% of the population was between 0 and 14 years of age; higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 77.1% of the population in 2011. The median age was 39.1, which is higher than the provincial median age of 36.5 (Statistics Canada 2012). Census data for Strathcona County includes data for rural areas and hamlets. It does not include data for municipalities.

In 2011, 3.8% of the county population identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Strathcona County does not anticipate any key issues associated with the Project. Local workers will likely be available to participate in the Project and any non-local workers would be easily absorbed into the population of the Edmonton Region. It was noted that the Project would not interfere with any key community events in the county (Mills pers. comm.).

City of Edmonton

The proposed pipeline corridor crosses the City of Edmonton for 33.1 km (RK 12.0 to RK 45.1). The City of Edmonton is located directly west of Strathcona County. The City of Edmonton is the largest municipality in the Edmonton Region. Trans Mountain has identified the City of Edmonton as a potential construction hub. It is a transportation hub serviced by both national railways, major highways and an international airport.

The proposed pipeline corridor in the City of Edmonton is located within the boundaries of the City of Edmonton MDP. The objectives of this plan are to: support sustainable urban form; integrate land use and transportation; design complete, healthy and livable communities; encourage urban design; support prosperity; protect, preserve and enhance the natural environment; support working within our region; manage land and resources; and maintain food and urban agriculture. This plan specifies restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project. The MDP outlines municipal policies related to pipeline corridors, such as: developing a risk management approach; collaborating with Edmonton Area Pipeline and Utility Operators' Committee (EAPUOC) and Energy Resources Conservation Board (ERCB); ensuring development setbacks from pipelines; and, if possible, planning pipelines within other utility corridors (City of Edmonton 2010).

The City of Edmonton is the political capital of Alberta and has a diversified economy. The economy of the city has traditionally been based on natural resources, such as agriculture and more recently oil and gas. In recent years the city's economy has diversified to include small business and industry, although it is still reliant on oil and gas (City of Edmonton 2013).

In 2011, the City of Edmonton's population was approximately 812,195, which is an 11.2% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 16.7% of the population is between 0 and 14 years of age, compared to 18.8% for Alberta. The workforce (population between 15 and 64 years) represented 77.7% of the population in 2011. The median age was 36.0 years, which is 0.5 years younger than the provincial median age of 36.5 years. The population is weighted slightly in favour of females (50.2% females) (Statistics Canada 2012).

In 2011, 5.3% of the population of the city identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- Short-term inconvenience during construction was identified at the Edmonton West Community Workshop,
- The issue of landowners receiving a single payment compared to continued profits of Trans Mountain was identified at the Edmonton West Community Workshop,
- Impacts on community gardens, local paths, walkways and neighborhoods. For example, the proposed use of the TUC for a community garden was identified at the Edmonton West Community Workshop and concerns regarding topsoil conservation and productivity were raised,
- Cumulative effects associated with other projects.

City of Spruce Grove

The proposed pipeline corridor crosses the City of Spruce Grove for 4.7 km (RK 57.1 to RK 61.3 and RK 62.2 to RK 62.7). The City of Spruce Grove is located in Parkland County, approximately 15 km west of the City of Edmonton on Highway 16.

The proposed pipeline corridor in the City of Spruce Grove is located within the boundaries of the City of Spruce Grove MDP. The overarching objective of this plan is to provide a framework to direct growth and change in Spruce Grove to 2020 in a way that conforms to the city's interpretation of community sustainability. The concepts of balance and adaptability underlie this framework. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project. The MDP plans for pipeline corridors within the context of the Capital Regional Growth Plan, and supports the protection of these corridors from incompatible development (City of Spruce Grove 2010).

The City of Spruce Grove's local economy is based on agriculture and industry, as well as housing individuals who work in the City of Edmonton (City of Spruce Grove 2013). The city has experienced rapid growth in recent years, as a result of land prices and an updated transportation system within the City of Spruce Grove resulting in decreased driving times to the City of Edmonton (Irving pers. comm.). Most of the growth is occurring in the northwest and northeast sections of the city (Irving pers. comm.).

In 2011, the City of Spruce Grove had a population of approximately 26,175, which is a 34.1% increase since 2006. The provincial population increased 10.8% over the same period. There is a young population, with 21.6% between the ages of 0 and 14 years of age, compared to 18.8% for Alberta. The median age is 33.7 years, 2.8 years younger that the provincial median age of 36.5 years. The workforce population (population between 15 and 64 years) was 76.8% of the total population. The gender ratio of the population is weighted slightly in favour of males (50.1% male) (Statistics Canada 2012).

In 2011, 6.2% of the population of the city identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0) and broader Project engagement, the following issues were identified:

- Opportunities for local employment.
- The proposed pipeline corridor is not located near the residential centre of the city, and thus concerns with residential disruption are not anticipated (Irving, Mustard, Butterfield pers. comm.).
- The proposed pipeline corridor and existing TMPL right-of-way cross areas that are planned for further residential and industrial development (Irving pers. comm.).
- Areas environmental concern, including wetlands and peat lands located around RK 61 to RK 62 and south of RK 59 to RK 59.5 (Irving pers. comm.).
- Workers travelling to the City of Edmonton for entertainment may cause traffic safety issues related to impaired driving (Nicol pers. comm.).
- An increase in population due to temporary workers may result in rent pressures and issues for people on low or fixed incomes; low-income housing is in short supply (Berry pers. comm.).
- The community has limited experience with temporary workers and would like to protect their identity as a family-oriented community (Berry pers. comm.).
- The potential for the temporary workforce to increase pressure on local family and support services (Berry pers. comm.).
- The importance of consultation, spill planning, and collaboration with communities (Nicol pers. Comm.).

Parkland County

Parkland County is located west of the City of Edmonton and east of Yellowhead County. There are four service areas within the boundaries of Parkland County: the City of Spruce Grove; the Town of Stony Plain; the Village of Wabamun; and the Hamlet of Entwistle, as well as six additional hamlets. The proposed pipeline corridor crosses Parkland County for 90 km (RK 43.4 to RK 43.5 and RK 45.1 to RK 135.0). The proposed pipeline corridor crosses the Hamlet of Entwistle (RK 133.7 to RK 135.0) within Parkland County. The Gainford Pump Station (RK 117.5) is also located in the Parkland County.

The proposed pipeline corridor in Parkland County is located within the boundaries of the Parkland County MDP. The guiding principles of the plan are to achieve sustainability while still protecting existing lifestyles and established land use patterns by: supporting environmental sustainability; supporting fiscal sustainability; supporting social sustainability; emphasizing economic development; respecting community character; and maintaining a reasonable degree of land use certainty. This plan specifies restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project. The MDP states that Alberta Energy and Utilities Board (AEUB) (now the Alberta Energy Regulator [AER]) subdivision and setback regulations respecting pipelines and other oil and gas facilities will be adhered to when considering further development (Parkland County 2007).

The county's economic base is historically agricultural, but is becoming increasingly residential and now includes business such as light industrial and commercial (Parkland County 2007). The Parkland County MDP identifies managing new growth, while ensuring the sustainability of rural communities, maintenance of rural character and maintaining the viability of the county's agriculture industry as a priority. North and west of the Village of Wabamun there is historic coal mining and reclamation (Hanlan pers. comm.).

Census data for Parkland County includes data for rural areas and hamlets. It does not include data for municipalities. In 2011, Parkland County had a population of approximately 30,570, which is a 4.6% increase from 2006. The provincial population increased 10.8% over the same period. The county's population is not overly young or old, with 19.2% between the ages of 0 and 14 years of age compared with 18.8% for Alberta. The median age is 42.2 years, 5.7 years older than the provincial median age of 36.5. The workforce population (population between 15 and 64 years) represents 77.1% of the total population. The gender ratio of the population is weighted slightly in favour of males (51.6% males) (Statistics Canada 2012).

In 2011, 6.2% of the population of the county identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

While the county does not have a formal position on camps, a construction camp is likely not preferred, as camps can result in social issues and behaviours not conducive with current community values. Integrating workers into the community is preferred. The City of Spruce Grove and the Town of Stony Plain are bedroom communities so there is not a lot of temporary accommodation available; they are not set up for temporary workers (Hanlan pers. comm.).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified (Hanlan pers. comm.):

- Winter is best for construction because of the large number of summer residents.
- It is important to understand any increase in spill risk associated with a twinned line;
- A temporary increase in traffic has been experienced with other projects, resulting in vehicle accidents.
- Construction camps are not preferred, as they can result in social issues and behaviours not aligned with current community values; however, there is limited temporary accommodation available (Hanlan pers.comm).
- There is potential for Project requirements and issues to contribute to capacity issues for RCMP and emergency services.

Town of Stony Plain

The proposed pipeline corridor crosses the Town of Stony Plain for approximately 7 km (RK 61.3 to RK 62.3 and RK 62.4 to RK 68.4). The Town of Stony Plain is located approximately 20 km west of Edmonton on the Alberta Provincial Highway No. 16. The Town of Stony Plain has been identified as a construction hub by Trans Mountain.

The proposed pipeline corridor in the Town of Stony Plain is located within the boundaries of the Town of Stony Plain MDP. This plan provides directions to manage growth and development within the Town of Stony Plan over the next 15 years to accommodate an estimated population of over 21,000 by the year 2020. Some of the guiding principles of the plan are to: preserve and enhance the quality of life for residents of Stony Plain; pursue mutually beneficial regional partnerships and alliances; maintain a small town atmosphere; and promote environmental stewardship by protecting and preserving natural areas. This plan specifies restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project. The MDP recognizes the requirement of setbacks from pipeline and utility rights-of-way, in accordance with AER regulations. The MDP also states that Area Structure Plans are required for new development and must address the environmental impacts and mitigation measures for incompatible land uses such as pipelines. Finally, the MDP encourages the joint use of utility and transportation corridors in order to minimize impacts and fragmentation of other land uses (Town of Stony Plain 2005).

The municipal economy is based on natural resources, including agriculture, coal, petroleum and natural gas (Town of Stony Plain 2013). Cultural emphasis and public art are important to the town, as is maintaining a small town feel (Frostad pers. comm.).

In 2011, the Town of Stony Plain had a population of approximately 15,050, which is a 21.7% increase since 2006. The provincial population increased 10.8% over the same period. The town's population is not overly young or old with 19.0% between the ages of 0 and 14 years of age compared to 18.8% for Alberta. The median age is 37.7 years; 1.2 years older than the provincial median age of 36.5 years. The workforce population (population between 15 and 64 years) is 73.8% of the total population. The gender ratio of the population is weighted slightly in favor of females (51.3% female) (Statistics Canada 2012).

In 2011, 6.3% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified (Frostad pers. comm.).

- A sewer trunk was installed from RK 67 to RK 68 so there is potential in that area for development.
- Quality of life issues include those related to domestic violence in the western portion of town and increased drug use leading to an increase in petty crime as a result of the town's proximity to Edmonton.
- The community is very environmentally conscious and has an increased sensitivity as a result of the 2005 CN spill in Wabamun.

Village of Wabamun

The proposed pipeline corridor crosses the Village of Wabamun for 1.5 km (RK 98.4 to RK 99.9) in Parkland County. The village has an economy based on summer tourism. The population of Wabamun increases in the summer months with tourists from Edmonton and the surrounding area. Summer tourism is focused around Wabamun Lake (Hannah pers. comm.).

The proposed pipeline corridor in the Village of Wabamun is located within the boundaries of the Village of Wabamun MDP. This plan seeks to harness the ideas and creativity of the Village of Wabamun's Council and residents, and articulate these ideas as goals and objectives for future development. The plan aims to facilitate multi-faceted growth and development, encourages the maintenance of a physical separation between incompatible land uses, and encourages the preservation and maintenance of quality of life, among other goals. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (Village of Wabamun 2010).

The Village of Wabamun's local economy has traditionally been based on coal, electrical power generation, gravel, strip mining, water and water-based activities. In recent years the village has been moving toward an economy based on residential and commercial growth and tourism (Alberta Community Profiles 2013).

In 2011, the Village of Wabamun's population was 661, which is a 10.0% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 20.4% of the population is between 0 and 14 years of age compared to 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 65.1% of the population in 2011. The population had a median age of 43.3 years, which is 6.8 years older than the provincial median age of 36.5 years. The population is weighted in favour of males (53.0% males) (Statistics Canada 2012).

Aboriginal identity data is not available for the Village of Wabamun.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified (Hannah pers. comm.).

- The closure of the Trans Alta coal plant has made many community members realize that they need to plan and ask specific questions about future Projects.
- Wabamun is currently working through issues related to the closure of the TransAlta Utilities Corporation Wabamun Generating Plant.
- The importance of open, transparent, easily understandable and available information.
- Winter construction is preferred in Wabamun because of the increased traffic in the summer, as a result of summer tourists.
- Construction noise, dust and traffic.
- Loons live and nest on Wabamun Lake.
- Residents are very environmentally conscious and sensitive since the 2005 CN spill.

6.1.3 Communities and Regions in the Socio-Economic Regional Study Area

This subsection presents information on communities and regions in the Socio-Economic RSA of the Edmonton Region. Selected population, mobility and income statistics are located in Tables A-1, A-3 and A-5 in Appendix A.

City of Fort Saskatchewan

The City of Fort Saskatchewan is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located approximately 15.3 km southwest from the City of Fort Saskatchewan (geodesic distance from RK 0.0). The City of Fort Saskatchewan is located approximately 20 km north of Sherwood Park in Strathcona County. The main economic drivers are commercial and heavy industry, and the provision of services to the petrochemical industry (Fort Saskatchewan 2013).

In 2011, the population of the City of Fort Saskatchewan was 19,050, which is a 27.3% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 19.3% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 77.1% of the population in 2011. The median age was 35.4 years, which is lower than the provincial median age of 36.5 years. The population was weighted in favour of females (50.4% female) (Statistics Canada 2012).

In 2011, 5.9% of the population of the city identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Village of Spring Lake

The Village of Spring Lake is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 3.4 km north from the Village of Spring Lake (geodesic distance from RK 73.5). The Village of Spring Lake is a lake community based on recreation (Village of Spring Lake 2013).

In 2011, the population of the Village of Spring Lake was 533, which is a 6.4% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 15.9% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 76.9% of the population in 2011. The median age was 42.2 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (50.5% male) (Statistics Canada 2012).

In 2011, 13.3% of the population of the village identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Summer Village of Betula Beach

The Summer Village of Betula Beach is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 4.4 km north from the Summer Village of Betula Beach (geodesic distance from RK 113.8).

In 2011, the population of the Summer Village of Betula Beach was 10, which is a 33.3% decrease from 2006. The provincial population increased 10.8% over the same period. In order to protect the confidentiality of individual respondents' personal information, Statistics Canada suppresses data for any geographical area with a population of less than 40 persons. Therefore, only total population counts are available for the Summer Village of Betula Beach (Statistics Canada 2012).

Aboriginal identity data is not available for the Village of Betula Beach.

Summer Village of Kapasiwin

The Summer Village of Kapasiwin is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 2.1 km north from the Summer Village of Kapasiwin (geodesic distance from RK 96.3).

In 2011, the population of the Summer Village of Kapasiwin was 10, which is a 74.4% decrease from 2006. The provincial population increased 10.8% over the same period. In order to protect the confidentiality of individual respondents' personal information, Statistics Canada suppresses data for any geographical area with a population of less than 40 persons. Therefore, only total population counts are available for the Summer Village of Kapasiwin (Statistics Canada 2012).

Aboriginal identity data is not available for the Village of Kapasiwin.

Summer Village of Lakeview

The Summer Village of Lakeview is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 0.9 km north from the Summer Village of Lakeview (geodesic distance from RK 96.5).

In 2011, the population of the Summer Village of Lakeview was 26, which is a 27.8% decrease from 2006. The provincial population increased 10.8% over the same period. In order to protect the confidentiality of individual respondents' personal information, Statistics Canada suppresses data for any geographical area with a population of less than 40 persons. Therefore, only total population counts are available for the Summer Village of Lakeview (Statistics Canada 2012).

Aboriginal identity data is not available for the Village of Lakeview.

Summer Village of Point Alison

The Summer Village of Point Alison is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 1.2 km north from the Summer Village of Point Alison (geodesic distance from RK 100.0).

In 2011, the population of the Summer Village of Point Alison was 15, which is the same as 2006. The provincial population increased 10.8% over the same period. In order to protect the confidentiality of individual respondents' personal information, Statistics Canada suppresses data for any geographical area with a population of less than 40 persons. Therefore, only total population counts are available for the Summer Village of Port Alison (Statistics Canada 2012).

Aboriginal identity data is not available for the Village of Point Alison.

Summer Village of Seba Beach

The Summer Village of Seba Beach is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 0.6 km north from the Summer Village of Seba Beach (geodesic distance from RK 114.8).

In 2011, the population of the Summer Village of Seba Beach was 143, which is a 29.6% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 10.7% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 66.4% of the population in 2011. The median age was 55.9 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of females (53.6% female) (Statistics Canada 2012).

In 2011 none of the population of the village identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Lac Ste Anne County

Lac Ste Anne County is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 1.9 km north from Lac Ste Anne County (geodesic distance from RK 121.9). The Town of Mayerthrope and the Town of Onoway are the major service centres in Lac Ste Anne County. There are eight hamlets located within the county including Cherhill, Glenevis, Greencourt, Gunn, Rich Valley, Rochfort Bridge, Darwell and Sangudo.

Lac Ste. Anne County has urban and rural centres with an economy based on agriculture (Lac Ste. Anne County 2013).

Census data for Lac Ste Anne County includes data for rural areas and hamlets. It does not include data for municipalities. In 2011, the population of Lac Ste Anne County was 10,260, which is a 3.8% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 17.6% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 74.0% of the population in 2011. The median age was 44.9 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (50.1% male) (Statistics Canada 2012).

In 2011, 9.3% of the population of the county identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Town of Mayerthrope

The Town of Mayerthrope is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 38.6 km northwest from the Town of Mayerthrope (geodesic distance from RK 143.8). The main economic drivers are agriculture, forestry, oil and gas and tourism (Alberta Community Profiles 2013).

In 2011, the population of the Town of Mayerthrope was 1,398, which is a 5.2% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 22.1% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 68.7% of the population in 2011. The median age was 43.9 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of females (51.4% female) (Statistics Canada 2012).

Aboriginal identity data is not available for the Town of Mayerthrope.

Town of Onoway

The Town of Onoway is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 14.9 km south from the Town of Onoway

(geodesic distance from RK 78.7). The main economic drivers are agriculture, farm services, gravel and retail and service trade (Alberta Community Profiles 2013).

In 2011, the population of the Town of Onoway was 1,039, which is an 18.8% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 21.1% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 70.3% of the population in 2011. The median age was 38.7 years, which is higher than the provincial median age of 36.5 years. The population was weighted equally between males and females (Statistics Canada 2012).

In 2011, 6.4% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Village of Alberta Beach

The Village of Alberta Beach is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 10.9 km south from the Village of Alberta Beach (geodesic distance from RK 93.7). The Village of Alberta Beach is a popular resort village with an economy based on recreation tourism (Village of Alberta Beach 2010).

In 2011, the population of the Village of Alberta Beach was 865, which is a 2.1% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 11% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 71.7% of the population in 2011. The median age was 50.5 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (52% male) (Statistics Canada 2012).

Aboriginal identity data is not available for the Village of Alberta Beach.

Summer Village of Birch Cove

The Summer Village of Birch Cove is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 42.8 km south from the Summer Village of Birch Cove (geodesic distance from RK 93.9).

In 2011, the population of the Summer Village of Birch Cove was 45, which is an 18.4% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 33.3% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 66.7% of the population in 2011. The median age was 47.5 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (55.5% male) (Statistics Canada 2012).

Aboriginal identity data is not available for the Summer Village of Birch Cove.

Summer Village of Castle Island

The Summer Village of Castle Island is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 15.9 km south from the Summer Village of Castle Island (geodesic distance from RK 90.1).

In 2011, the population of the Summer Village of Castle Island was 19, which is a 13.6% decrease from 2006. The provincial population increased 10.8% over the same period. In order to protect the confidentiality of individual respondents' personal information, Statistics Canada suppresses data for any geographical area with a population of less than 40 persons. Therefore, only total population counts are available for the Summer Village of Castle Island (Statistics Canada 2012).

Aboriginal identity data is not available for the Summer Village of Castle Island.

Summer Village of Nakamun Park

The Summer Village of Nakamun Park is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 35.4 km south from the Summer Village of Nakamun Park (geodesic distance from RK 78.7).

In 2011, the population of the Summer Village of Nakamun Park was 36, which is a 59.1% decrease from 2006. The provincial population increased 10.8% over the same period. In order to protect the confidentiality of individual respondents' personal information, Statistics Canada suppresses data for any geographical area with a population of less than 40 persons. Therefore, only total population counts are available for the Summer Village of Nakamun Park (Statistics Canada 2012).

Aboriginal identity data is not available for the Summer Village of Nakamun Park.

Summer Village of Ross Haven

The Summer Village of Ross Haven is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 17.7 km south from the Summer Village of Ross Haven (geodesic distance from RK 93.9).

In 2011, the population of the Summer Village of Ross Haven was 137, which is a 30.8% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 21.4% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 62.0% of the population in 2011. The median age was 51.3 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of females (53.6% female) (Statistics Canada 2012).

In 2011, none of the population of the summer village identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Summer Village of Silver Sands

The Summer Village of Silver Sands is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 4.4 km south from the Summer Village of Silver Sands (geodesic distance from RK 113.9).

In 2011, the population of the Summer Village of Silver Sands was 85, which is a 50.9% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 5.9% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 52.9% of the population in 2011. The median age was 54.8 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (52.9% male) (Statistics Canada 2012).

In 2011, none of the population of the summer village identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Summer Village of South View

The Summer Village of South View is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 7.5 km south from the Summer Village of South View (geodesic distance from RK 112.7).

In 2011, the population of the Summer Village of South View was 35, which is a 69.6% decrease from 2006. The provincial population increased 10.8% over the same period. In order to protect the confidentiality of individual respondents' personal information, Statistics Canada suppresses data for any geographical area with a population of less than 40 persons. Therefore, only total population counts are available for the Summer Village of South View (Statistics Canada 2012).

Aboriginal identity data is not available for the Summer Village of South View.

Summer Village of Sunrise Beach

The Summer Village of Sunrise Beach is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 24.4 km south from the Summer Village of Sunrise Beach (geodesic distance from RK 66.4).

In 2011, the population of the Summer Village of Sunrise Beach was 149, which is a 12.4% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 6.7% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 73.8% of the population in 2011. The median age was 51.3 years, which is higher than the provincial median age of 36.5 years. The population was weighted equally between males and females (Statistics Canada 2012).

Aboriginal identity data is not available for the Summer Village of Sunrise Beach.

Summer Village of Sunset Point

The Summer Village of Sunset Point is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 13.0 km south from the Summer Village of Sunset Point (geodesic distance from RK 90.5).

In 2011, the population of the Summer Village of Sunset Point was 221, which is an 8.7% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 9.1% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 81.4% of the population in 2011. The median age was 51.8 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (54.3% male) (Statistics Canada 2012).

In 2011, none of the population of the summer village identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Summer Village of Val Quentin

The Summer Village of Val Quentin is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 10.8 km south from the Summer Village of Val Quentin (geodesic distance from RK 93.7).

In 2011, the population of the Summer Village of Val Quentin was 157, which is a 13.3% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 9.7% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 70.1% of the population in 2011. The median age was 53.8 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (53.8% male) (Statistics Canada 2012).

In 2011, none of the population of the summer village identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Summer Village of West Cove

The Summer Village of West Cove is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 13.3 km south from the Summer Village of West Cove (geodesic distance from RK 104.7).

In 2011, the population of the Summer Village of West Cove was 121, which is a 28.4% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 4.2% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 78.5% of the population in 2011. The median age

was 49.4 years, which is higher than the provincial median age of 36.5 years. The population was weighted equally between males and females (Statistics Canada 2012).

In 2011, none of the population of the summer village identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Summer Village of Yellowstone

The Summer Village of Yellowstone is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 18.0 km south from the Summer Village of Yellowstone (geodesic distance from RK 93.7).

In 2011, the population of the Summer Village of Yellowstone was 124, which is a 27.1% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 16.0% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 52.4% of the population in 2011. The median age was 54.2 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (52.4% male) (Statistics Canada 2012).

Aboriginal identity data is not available for the Summer Village of Yellowstone.

Sturgeon County

Sturgeon County is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 7.0 km north from Sturgeon County (geodesic distance from RK 49.6). The Town of Morinville is the major service centre in Sturgeon County. There are 10 hamlets located within the county including Alcomdale, Calahoo, Carbondale, Cardiff, Lamoureux, Mearns, Namao, Pine Sands, Riviere Qui Barre and Villeneuve.

The county's economic base is agriculture and farming, including the production of grains and oilseed, cattle, bison, elk and poultry. Recent diversification in the economy has included small to medium scale industrial activity, transportation/logistics and oil and gas servicing (Sturgeon County 2011).

Census data for Sturgeon County includes data for rural areas and hamlets. It does not include data for municipalities. In 2011, the population of the Sturgeon County was 19,580, which is a 5.5% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 20.7% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 77.5% of the population in 2011. The median age was 38.4 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (52.2% male) (Statistics Canada 2012).

In 2011, 5.7% of the population of the county identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Town of Morinville

The Town of Morinville is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 29.2 km south from the Town of Morinville (geodesic distance from RK 45.9). The Town of Morinville has a diverse economic base including light and medium industrial businesses, educational, health and welfare services, transportation and infrastructure, construction and oil and gas (Alberta Community Profiles 2013).

In 2011, the population of the Town of Morinville was 8,569, which is a 26.5% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 22% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 77.3% of the population in 2011. The median age was 32.8 years, which is lower than the provincial median age of 36.5 years. The population was weighted in favour of females (50.3% female) (Statistics Canada 2012).

In 2011, 6.1% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Town of Bon Accord

The Town of Bon Accord is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 32.6 km south from the Town of Bon Accord (geodesic distance from RK 0.0). The main economic drivers are agriculture, tourism, retail trade and construction (Town of Bon Accord 2012).

In 2011, the population of the Town of Bon Accord was 1,488, which is a 3% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 22.5% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 79.3% of the population in 2011. The median age was 33.8 years, which is lower than the provincial median age of 36.5 years. The population was weighted in favour of males (50.4% male) (Statistics Canada 2012).

In 2011, 8.2% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Town of Gibbons

The Town of Gibbons is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 29.2 km south from the Town of Gibbons (geodesic distance from RK 0.0). The Town of Gibbons is a residential community with most of the workforce commuting to Edmonton, Fort Saskatchewan and surrounding industrial areas (Alberta Community Profiles 2013).

In 2011, the population of the Town of Gibbons was 3,030, which is a 14.7% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 23.8% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 76.2% of the population in 2011. The median age was 32.9 years, which is lower than the provincial median age of 36.5 years. The population was weighted in favour of males (50.8% male) (Statistics Canada 2012).

In 2011, 6.4% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Town of Legal

The Town of Legal is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 46.9 km south from the Town of Legal (geodesic distance from RK 0.0). The Town of Legal acts as a service centre for the surrounding agriculture community as well as being a popular satellite community to Edmonton with most of the workforce commuting to Edmonton or St. Albert (Alberta Community Profiles 2013).

In 2011, the population of the Town of Legal was 1,225, which is a 2.8% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 23.7% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 72.7% of the population in 2011. The median age was 34.4 years, which is lower than the provincial median age of 36.5 years. The population was weighted in favour of males (50.6% male) (Statistics Canada 2012).

Aboriginal identity data is not available for the Town of Legal.

Town of Redwater

The Town of Redwater is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 46.2 km south from the Town of Redwater (geodesic distance from RK 0.0). The main economic drivers are oil and gas and farming (Town of Redwater 2013).

In 2011, the population of the Town of Redwater was 1,915, which is a 13% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 16.7% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 67.1% of the population in 2011. The median age was 42.2 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of females (50.1% female) (Statistics Canada 2012).

Aboriginal identity data is not available for the Town of Redwater.

City of St. Albert

The City of St. Albert is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 9.8 km south from the City of St. Albert (geodesic distance from RK 42.4). The City of St. Albert has a diversified economic base, providing a service centre to residents and surrounding area, including light industrial, warehousing, construction and plastics (Alberta Community Profiles 2013).

In 2011, the population of the City of St. Albert was 61,470, which is a 6.4% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 18.3% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 76.5% of the population in 2011. The median age was 40.2 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of females (51.1% female) (Statistics Canada 2012).

In 2011, 3.6% of the population of City of St. Albert identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Brazeau County

Brazeau County is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 23.9 km north from Brazeau County (geodesic distance from RK 126.6). There are seven hamlets located within the county including Buck Creek, Cynthia, Lodgepole, Poplar Ridge, Rocky Rapids and Violet Grove.

The county's economic base is oil and gas, forestry, agriculture and tourism (Alberta Community Profiles 2013).

Census data for Brazeau County includes data for rural areas and hamlets. It does not include data for municipalities. In 2011, the population of the Brazeau County was 7,195, which is a 2.2% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 19.7% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 78.0% of the population in 2011. The median age was 39.4 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (52.0% male) (Statistics Canada 2012).

In 2011, 7.9% of the population of the county identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Town of Drayton Valley

The Town of Drayton Valley is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 37.1 km north from the Town of Drayton Valley (geodesic distance from RK 126.6). The Town of Drayton Valley is the primary service centre in Brazeau County. The main economic base is oil and gas, although forestry, agriculture and small businesses are also major sectors (Alberta Community Profiles 2013).

In 2011, the population of the Town of Drayton Valley was 7,049, which is a 2.3% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 21.6% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 75.5% of the population in 2011. The median age was 32.7 years, which is lower than the provincial median age of 36.5 years. The population was weighted in favour of females (50.1% female) (Statistics Canada 2012).

In 2011, 3.7% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Village of Breton

The Village of Breton is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 49.5 km north from the Village of Breton (geodesic distance from RK 101.7). The main economic drivers are agriculture, oilfield activity and logging (Alberta Community Profiles 2013).

In 2011, the population of the Village of Breton was 496, which is a 9.8% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 18.2% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 67.5% of the population in 2011. The median age was 41.6 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of females (53.4% female) (Statistics Canada 2012).

In 2011, 9.5% of the population of the village identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Leduc County

Leduc County is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 3.6 km north from Leduc County (geodesic distance from RK 27.5). There are eight hamlets located within the county including Buford, Kavanagh, Looma, New Sarepta, Nisku, Rolly View, Sunnybrook and Telfordville.

The county's economic base is oil and gas, with additional economic drivers including agriculture, advanced manufacturing, environment and transportation (Alberta Community Profiles 2013).

Census data for Leduc County includes data for rural areas and hamlets. It does not include data for municipalities. In 2011, the population of the Leduc County was 13,540, which is a 3.1% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 18.5% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce (population between 15 and 64 years) was 76.7% of the population in 2011. The median age was 41.9 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (51.9% male) (Statistics Canada 2012).

In 2011, 3.3% of the population of the county identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

City of Leduc

The City of Leduc is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 13.4 km north from the City of Leduc (geodesic distance from RK 27.6). The main economic base in the City of Leduc is oil and gas, although agriculture still plays a major role in the city's economy. Industrial growth related to oil patch development is also an integral part of the city's economy (Alberta Community Profiles 2013).

In 2011, the population of the City of Leduc was 24,275, which is a 43% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 20.6% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 74.7% of the population in 2011. The median age was 34 years, which is lower than the provincial median age of 36.5 years. The population was weighted in favour of females (50.2% female) (Statistics Canada 2012).

In 2011, 4.7% of the population of the city identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Town of Beaumont

The Town of Beaumont is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 4.6 km north from the Town of Beaumont (geodesic distance from RK 17.6). The main economic drivers are residential housing and commercial development, resulting from the town's proximity to the City of Edmonton (Alberta Community Profiles 2013).

In 2011, the population of the Town of Beaumont was 13,285, which is a 48.3% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 25.5% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 77.5% of the population in 2011. The median age was 32.3 years, which is lower than the provincial median age of 36.5 years. The population was weighted in favour of males (50.1% male) (Statistics Canada 2012).

In 2011, 4.3% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Town of Calmar

The Town of Valmar is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 22.3 km northeast from the Town of Calmar (geodesic distance from RK 29.7). The main economic drivers are oil and gas and agriculture (Town of Calmar 2013).

In 2011, the population of the Town of Calmar was 1,970, which is a 0.6% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 20.3% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 77.2% of the population in 2011. The median age was 36.8 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (52.0% male) (Statistics Canada 2012).

In 2011, 13.0% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Town of Devon

The Town of Devon is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 10.8 km northeast from the Town of Devon (geodesic

distance from RK 29.9). The main economic drivers are oil and gas and tourism (Alberta Community Profiles 2013).

In 2011, the population of the Town of Devon was 6,510, which is a 3.9% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 21.9% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 74.6% of the population in 2011. The median age was 35.2 years, which is lower than the provincial median age of 36.5 years. The population was weighted in favour of males (50.2% male) (Statistics Canada 2012).

In 2011, 7.0% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Village of Thorsby

The Village of Thorsby is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 33.8 km north from the Village of Thorsby (geodesic distance from RK 61.4). The main economic drivers are manufacturing, agriculture and oil and gas in the surrounding area (Alberta Community Profiles 2013).

In 2011, the population of the Village of Thorsby was 797, which is a 15.7% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 21.9% of the population was between 0 and 14 years of age, higher than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 64.0% of the population in 2011. The median age was 38 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (51.4% male) (Statistics Canada 2012).

Aboriginal identity data is not available for the Village of Thorsby.

Village of Warburg

The Village of Warburg is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 41.2 km north from the Village of Warburg (geodesic distance from RK 85.6). The main economic drivers are farming, oil and gas and dairying (Alberta Community Profiles 2013).

In 2011, the population of the Village of Warburg was 789, which is a 18.3% increase from 2006. The provincial population increased 10.8% over the same period. Approximately 18.3% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 65.9% of the population in 2011. The median age was 41.8 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (50.1% male) (Statistics Canada 2012).

Aboriginal identity data is not available for the Village of Warburg.

Summer Village of Golden Days

The Summer Village of Golden Days is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The pipeline route is located 51.9 km northeast from the Summer Village of Golden Days (geodesic distance from RK 29.7).

In 2011, the population of the Summer Village of Golden Days was 141, which is a 31.9% decrease from 2006. The provincial population increased 10.8% over the same period. None of the population was between 0 and 14 years of age. The workforce population (population between 15 and 64 years) was 78.0% of the population in 2011. The median age was 57.5 years, which is higher than the provincial median age of 36.5 years. The population was weighted in favour of males (53.2% male) (Statistics Canada 2012).

In 2011, none of the population of the summer village identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

Summer Village of Itaska Beach

The Summer Village of Itaska Beach is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 51.6 km northeast from the Summer Village of Itaska Beach (geodesic distance from RK 29.9).

In 2011, the population of the Summer Village of Itaska Beach was 20, which is a 42.9% decrease from 2006. The provincial population increased 10.8% over the same period. In order to protect the confidentiality of individual respondents' personal information, Statistics Canada suppresses data for any geographical area with a population of less than 40 persons. Therefore, only total population counts are available for the Summer Village of Itaska Beach (Statistics Canada 2012).

Aboriginal identity data is not available for the Summer Village of Itaska Beach.

Summer Village of Sundance Beach

The Summer Village of Sundance Beach is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 51.6 km north from the Summer Village of Sundance Beach (geodesic distance from RK 61.4).

In 2011, the population of the Summer Village of Sundance Beach was 82, which is a 19.6% decrease from 2006. The provincial population increased 10.8% over the same period. Approximately 11.8% of the population was between 0 and 14 years of age, lower than the 18.8% for Alberta. The workforce population (population between 15 and 64 years) was 61.0% of the population in 2011. The median age was 54 years, which is higher than the provincial median age of 36.5 years. The population was evenly weighted between males and females (Statistics Canada 2012).

In 2011, none of the population of summer village identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

6.2 Rural Alberta Region

6.2.1 Regional Overview

6.2.1.1 Population and Demographics

In 2011, the total population of the Rural Alberta Region was approximately 29,300, a 3.5% increase from 2006. Table A-1 in Appendix A summarizes select population characteristics for municipalities and Aboriginal communities in the region. As evidenced by the percent change in population from 2006 to 2011, the Town of Edson is the most rapidly growing community in the region. Conversely, the Town of Hinton is declining in population. Population fluctuations in the Town of Hinton are related to the presence of workers as a result of resource-based activities in the region (Ramme, Lyons pers. comm.). In the Rural Alberta Region, 11.5 % of the population identifies as Aboriginal. There are several IRs and potentially affected Aboriginal communities in this region; however, no IRs are crossed by the proposed pipeline corridor.

In 2011, population mobility in the Rural Alberta Region varied depending on the community. The Town of Edson had the highest percentage of internal migrants between 2009 and 2011 (internal migrants are people who moved to the community); approximately 5.5% of the population in Edson had moved from within Alberta, while approximately 1.5% of the population had moved from another province. Table A-3 in Appendix A summarizes select population mobility characteristics for municipalities and Aboriginal communities in the region.

Shadow populations are characterized by a large component of the temporary population living in project accommodations, hotels and motels, and campgrounds but also living in permanent residences.

Yellowhead County is comprised of farming and agriculture in the east and a resource-based, transient population in the west. The population of the county is relatively consistent, although there are periodic increases as a result of resource-based activities. Historically, during periods of population increase, there has been a shadow population of approximately 8,000 people (Ramme, Lyons pers. comm.).

The percentage of private dwellings occupied by usual (permanent) residents compared to the total number of private dwellings can be an indication of the presence of a shadow population. In the Rural Alberta Region in 2011, the average percentage of private dwellings occupied by permanent residents was 90.3%. Private dwellings occupied by permanent residents ranged from 89.2% in the Hamlet of Wildwood to 92.7% in the Hamlet of Evansburg. Based on this data, it appears the shadow population in the Rural Alberta Region was low in 2011, although a shadow population is known to fluctuate and the average percentage of private dwellings occupied by permanent residents does not account for the shadow population present in temporary accommodations. Section 8.4.2 provides information on housing (temporary and permanent accommodations) in the Rural Alberta Region.

Population projections are based on CDs, the boundaries of which do not directly mirror those of the Rural Alberta Region, as described in this report. For example, in 2011, the total population of CD14 - which includes all communities in Yellowhead County and Improvement District (ID) No. 25 (Willmore Wilderness) — was 29,111. The medium projected population for CD14 in 2041 is 29,635 (Alberta Treasury Board and Finance 2012).

6.2.1.2 Income Levels and Distribution

In 2011, the median income for the Rural Alberta Region was approximately $34,700. The median income ranged from $8,398 in the O'Chiese 203 IR to $38,111 in the Town of Hinton. Gender differentials in income varied amongst communities in the Rural Alberta Region. In total, males in the Rural Alberta Region had a median income of $53,939, compared to $22,031 for females. In 2011, the median income of those working full-year, full-time and with employment income was approximately $59,000 for the Rural Alberta Region. It ranged from $29,914 in O'Chiese 203 to $64,503 in the Town of Hinton (Statistics Canada 2013a).

In 2011, O'Chiese 203 had the highest government transfer as a percent of income (42.8%) and the Town of Hinton had the lowest (6.5%). Government transfer refers to all cash benefits received from the federal, provincial, territorial or municipal governments (*e.g.,* Old Age Security, Employment Insurance) (Statistics Canada 2013a). Table A-5 in Appendix A summarizes select income characteristics for municipalities and Aboriginal communities in the region.

6.2.1.3 Aboriginal Culture

Aboriginal people living both on and off IRs represent a unique demographic in the Rural Alberta Region. The Rural Alberta Region includes three IRs, and five Aboriginal communities located in region may potentially be affected by the Project (asserted traditional territories of potentially affected Aboriginal communities may be crossed by more than one socio-economic region).

People of Aboriginal identity represent 11.5% of the population in the Rural Alberta Region. Key traditional land uses in the region include hunting, fishing, trapping, gathering (food and medicinal plants, plants used for traditional crafts) and the ceremonial use or maintenance of spiritual sites as well as production of traditional crafts, regalia, games and instruments. Bands conduct pow-wows and sweat lodges. These traditional practices are carried out today for both cultural and subsistence purposes. The Aboriginal communities in the region also contribute to local industry, working as contractors and business owners in oil and gas, forestry, tourism and development. Communities have demonstrated a desire for training and work experience in these fields. Unemployment rates for IRs in the region ranges from moderately low to high (Statistics Canada 2013a), and generally barriers to employment include lack of transportation, lack of training and mental and physical health issues.

As a result of the level of urbanization and the history of development in the region, there is a some degree of social and economic integration between Aboriginal and non-Aboriginal populations in the

region. The relatively low levels of use of Aboriginal language by those of Aboriginal identity reflect this integration. For example, in the Town of Hinton in 2006, approximately 9.2% of the Aboriginal identity population indicated knowledge of an Aboriginal language, and approximately 0.9% of the Aboriginal identity population indicated that the language spoken most often at home was an Aboriginal language (Statistics Canada 2007). In the Town of Edson in 2006, approximately 2.4% of the Aboriginal identity population indicated knowledge of an Aboriginal language, and approximately 0% of the Aboriginal identity population indicated that the language spoken most often at home was an Aboriginal language (Statistics Canada 2007). Use and knowledge of Aboriginal languages tends to be higher on-reserve.

Detailed overviews and a list of Aboriginal communities and reserves are found in Section 5.0 and in the Traditional Land and Resource Use Technical Report of Volume 5D.

6.2.1.4 Community Way of Life

The Rural Alberta Region is more agricultural and rural in nature than the Edmonton Region, and the Project crosses land primarily in the unincorporated rural areas of Yellowhead County. The region includes two municipal centres, the Town of Edson and the Town of Hinton (both of which are crossed by the proposed pipeline corridor), as well as several hamlets. Outdoor recreation opportunities and activities such as hiking, biking and skiing are plentiful in the region, in both urban areas and unincorporated areas, and are an important part of community way-of-life. The Town of Edson Section 7.5.2 further discusses outdoor recreational use in the Rural Alberta Region.

The Town of Edson and the Town of Hinton have experience with major projects and temporary workers. Feedback from technical discussions included the following issues: crowding in housing as a result of temporary workers (Lemieux pers. comm.); and hotels that opened during previous projects are operating at a high occupancy rate (Kreiner pers. comm.).

The Town of Edson indicated that the number of temporary foreign workers residing in the community has increased. Foreign workers are having an impact on services and there are challenges in assuring that they integrate effectively into the community. The town also indicated that issues such as drug use, break-ins, impaired driving and bar fights are associated with the presence of transient workers (Lemieux pers. comm.).

Generally, rural areas of the region are experiencing increases in rates of crimes against people (such as assaults) as wells as traffic violations (Edson Leader 2013). Officials note that certain types of drug violations have declined in recent years (*e.g.,* methamphetamine distribution and use is decreasing), while other types of drug use are more frequent (*e.g.,* cocaine and marijuana use) (Knight pers. comm., Edson Leader 2013). Rates of violent crime generally increased for police services across the region between 2007 and 2012 (ranging from an increase of approximately 10% for municipal areas serviced by Edson RCMP to an increase of approximately 24% for rural areas serviced by Edson RCMP). Rates of property crime violations declined in municipal areas between 2007 and 2012, but increased in rural service areas. Most police service areas reported minor increases in the rate of drug violations between 2007 and 2012. Table 6.2-1 provides information on crime rates for key police service areas in the Rural Alberta Region based on incidents per 1,000 people.

Key community events and assets that have been identified in the region that could interact with the Project include the following.

- In the Town of Edson, the proposed pipeline corridor crosses Vision Park (approximately RK 228.8 to RK 229.8), which has heavily used baseball diamonds (the Edson Kinsmen Association hosts the annual Edson Kin Slo-Pitch Tournament at Vision Park over the August long weekend).
- In the Town of Edson, existing trails used commonly for snowmobiling are located from RK 231 to RK 234.

Key socio-cultural interests and issues in the region that have been identified by stakeholders related to the Project include the following.

- Opportunities for local businesses, workers, and contractors.
- Economic spin-offs related to temporary Project workforce residing in regional communities.
- Opportunities to use the right-of-way for recreational purposes (*e.g.,* walking, biking, horseback riding, snowmobiling), and the management of various recreational users of the right-of-way.
- The potential for crowding in housing, service pressures, and social issues related to temporary workers.
- Construction-related noise.
- Protection of cultural or heritage sites.
- Protection of land, vegetation, watercourses and wildlife used for traditional Aboriginal livelihood and cultural purposes.

TABLE 6.2-1

CRIME RATES, RURAL ALBERTA REGION (2007 TO 2012)

	Rate per 1,000 people														
	Total Violent Criminal Code Violations			Total Property Crime Violations			Total Other Criminal Code Violations (Excluding Traffic)			Total Criminal Code Traffic Violations			Total Drug Violations		
Police Service Area	**2007**	**2012**	**% Change**	**2007**	**2012**	**% Change**	**2007**	**2012**	**% Change**	**2007**	**2012**	**% Change**	**2007**	**2012**	**% Change**
Edson, RCMP, municipal	24.3	26.7	9.9%	107.3	69.2	-35.5%	27.8	25.5	-11.9%	18.6	17.8	-4.3%	7.5	7.7	2.7%
Edson, RCMP, rural	43.4	53.8	24.0%	27.8	35.0	25.0%	3.7	4.6	24.3%	7.0	7.2	2.9%	3.3	3.9	18.2%
Evansburg, RCMP, rural	10.5	12.9	22.9%	31.8	42.8	34.6%	7.5	10.7	42.7%	6.9	6.4	-7.2%	4.8	5.3	10.4%
Hinton RCMP, municipal	18.7	22.9	22.5%	63.0	50.3	-20.2%	19.0	29.7	56.3%	17.2	10.3	-40.1%	4.1	5.4	31.7%
Hinton RCMP, rural	Information suppressed to meet the confidentiality requirements of the *Statistics Act*														

Source: Statistics Canada 2013c

6.2.2 Communities and Regions in the Project Footprint

This subsection presents information on communities and regions in the Project Footprint of the Rural Alberta Region. Selected population, mobility and income statistics are located in Tables A-1, A-3 and A-5 in Appendix A.

Yellowhead County

The proposed pipeline corridor crosses Yellowhead County for approximately 204.4 km (RK 135.0 to RK 339.4). Yellowhead County is located west of Parkland County and east of Jasper National Park. The Town of Edson and Town of Hinton are located within the boundaries of Yellowhead County and are within the proposed pipeline corridor. Eight hamlets are located in the county including Brule, Cadomin, Evansburg, Marlboro, Niton Junction, Peers, Robb and Wildwood (Yellowhead County 2012). No hamlets are crossed by the proposed pipeline corridor in Yellowhead County. Several Project pump stations are located in Yellowhead County: the Niton Pump Station (RK 191.4), Wolf Pump Station (RK 206.2), Edson Pump Station (RK 247.1) and Hinton Pump Station (RK 339.4).

Hamlets within Yellowhead County do not have their own governance; they are represented by Yellowhead County's elected officials. The hamlets of Evansburg and Wildwood have separate Chambers of Commerce and are both fully serviced communities (water, sewer and emergency) (Ramme pers. comm.). Evansburg is the largest hamlet within Yellowhead County and supports a business centre predominately catering to the surrounding agricultural community. Services include a grocery store, clothing store, restaurants, bakery, hairdressers and other small businesses. Business development in the surrounding hamlets is supported by the Evansburg/Entwhistle Chamber of Commerce (Yellowhead County 2012).

Key economic activity in the County includes agriculture and natural resource extraction. A majority of the county's tax base comes from resource industries (Ramme pers. comm.). Farming and agriculture activities are focused in the eastern parts of the county, and resource activities are focused in the western portion. An area of commercial activity is being developed around Niton Junction; a "gasoline alley" is being developed to provide amenities for tourists and highway users such as gas stations, hotels and restaurants (Ramme pers. comm.).

The proposed pipeline corridor in Yellowhead County is located within the boundaries of the Yellowhead County MDP. The purpose of this plan is to provide Yellowhead County residents and Council with a framework to guide decision-making that is necessary to achieve the county's 20 year vision for the future. The plan has been developed to guide future policy, land use and infrastructure investment decisions, and strike a balance between economic, social, physical development and environmental considerations, among other goals. This plan specifies restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project. The plan mentions the need to apply AER Setback Regulations and Guidelines concerning pipelines when considering subdivision and development applications (Yellowhead County 2006a).

Census data for Yellowhead County includes data for rural areas and hamlets. It does not include data for municipalities. In 2011, Yellowhead County had a population of approximately 10,470, which is a 4.2% increase since 2006. The provincial population increased 10.8% over the same period. The county's population is older than average, with 18.6% between the ages of 0 and 14 years of age compared with 18.8% for Alberta. The median age is 43.5 years, 7 years older than the provincial median age of 36.5 years. The workforce population (population between 15 and 64 years) is 74.3% of the total population. The gender ratio of the population is weighted slightly in favour of males (52.1% male) (Statistics Canada 2012).

In 2011, 8.1% of the population of the county identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

There are periodic increases in population in the county resulting from temporary workers associated with resource-based activities. Historically, during periods of population increase, there has been a shadow population of approximately 8,000 (Ramme, Lyons pers. comm.).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified (Ramme, Lyons pers. comm.).

- Muskeg is present around Chip Lake.
- The Project will be positive in terms of tax revenues for the County; most residents embrace resource exploration (Ramme pers. comm.).

Town of Edson

The proposed pipeline corridor crosses the Town of Edson for approximately 9.2 km (RK 228.0 to RK 235.5 and RK 235.6 to RK 237.3). The Town of Edson is located approximately 180 km west of the City of Edmonton on Highway 16. The Town of Edson has been identified as a construction hub by Trans Mountain.

The proposed pipeline corridor in the Town of Edson is located within the boundaries of the Town of Edson MDP and the Edson Urban Fringe Intermunicipal Development Plan. The Town of Edson MDP is a statement of how the Council and residents of the Town of Edson wish to see the community evolve over the next 15 to 20 years. The plan provides the broad policies which serve as a basis for all other local planning controls and set the parameters needed to evaluate future development and subdivision proposals. Some of the objectives of the plan are to maximize the quality of life of town residents, provide for growth to occur in an orderly and efficient manner, and to preserve and enhance important local heritage features. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (Town of Edson 2006).

The Edson Urban Fringe Intermunicipal Development Plan provides a framework for the long-term growth and development of the lands located within the Edson Fringe Plan Area that includes lands in Yellowhead County and the Town of Edson. The objectives of the plan include joint municipal plan objectives, objectives for lands within the town of Edson, and objectives for lands within Yellowhead County. This plan does not specify restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project. However, it does state that pipeline rights-of-way, wells and facilities that extract, carry or process oil or natural gas are regulated by the AER by Directive. Subdivision and development adjacent to these developments are also subject to regulation, particularly with regard to setbacks from non-compatible land uses, such as residences and institutions or commercial establishments that include overnight accommodation (Yellowhead County 2007).

Natural resources including coal, clay, sand and gravel, oil and natural gas, timber and fish form the basis for economic activity in the Town of Edson. Recently forestry and agriculture have become important economic drivers in the town and surrounding area (Alberta Community Profiles 2013).

In 2011, the Town of Edson had a population of approximately 8,475, which is a 4.6% increase since 2006. The provincial population increased 10.8% over the same period. Approximately 19.4% of the population is between the ages of 0 and 14 years of age compared to 18.8% for Alberta. The median age was 35.1 years, 1.4 years younger that the provincial median age of 36.5. The workforce (population between 15 and 64 years) was 78.2% of the total population. The gender ratio of the population is weighted slightly in favour of males (50.9% male) (Statistics Canada 2012).

In 2011, 7.8% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- Reducing risk to the community if there was a spill/incident close to residents; safety and environmental concern are key (Lemieux pers. comm.).

- Interest in maintaining and developing walking trails (existing trails are located between RK 231 and RK 234) (Lemieux pers. comm.).

- Growth and tax revenue increases are important to the town (Lemieux pers. comm.).

- Concern regarding the influx of workers, and the number of foreign workers, creating added strain on infrastructure and services (*i.e.,* housing, RCMP) (Chomeakwich, Butler pers. comm.).

- Vandalism, drinking, drug use, break-ins, impaired driving and bar fights increase with the number of transient workers (Butler pers. comm.).

- During times of economic prosperity in the past, incidents of family violence tends to rise (Butler pers. comm.).

- Lack of daycare capacity in the event of increasing demand (Butler pers. comm.).

Town of Hinton

The proposed pipeline corridor crosses the Town of Hinton for 4.6 km (RK 321.7 to RK 326.3). The Town of Hinton is approximately 85 km west of the Town of Edson and 20 km east of Jasper National Park on Highway 16. The Town of Hinton has been identified as a potential construction hub by Trans Mountain.

The proposed pipeline corridor in the Town of Hinton is located within the boundaries of the Town of Hinton MDP and the Town of Hinton Community Development and Enhancement Plan. The Town of Hinton MDP aims to provide guidance for public and private development decisions within the Town. It provides a means of coordinating the thinking and actions of the Town and directing it towards achieving immediate and long term land use goals and aspirations. The Plan is a guide for future development - a framework for decision making. This plan specifies restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project. Hinton supports resource-based industries but states that further industrial development must be done in a way that is sustainable and attractive. The MDP requires that future development be of high visual quality, that existing vegetation should be used to screen development and that municipal bylaws be enforced to minimize nuisance and unsightly premises (Town of Hinton 1998).

The Town of Hinton Community Development and Enhancement Plan integrates the Town of Hinton Parks Master Plan, Visitor Attractions Plan and Urban form Plan. The underlying objective of this three-part plan is to provide a practical and effective framework for community development and enhancement within the Town of Hinton. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (Town of Hinton 2003).

The Town of Hinton's local economy has traditionally been based on natural resources, but has emerging tourism, residential and servicing industries (Town of Hinton 2013). The leading employers include Teck Coal, Hinton Pulp and Grande Yellowhead Regional School Division (Town of Hinton 2013). The town is a service centre for other communities including the Town of Grande Cache, Municipality of Jasper, Yellowhead County and the Village of Valemount, BC (Town of Hinton 2013).

In 2011, the Town of Hinton had a population of approximately 9,640, which is a 1% decrease since 2006. The provincial population increased 10.8% over the same period. The town's population is not overly young or old with 19.7% between the ages of 0 and 14 years of age compared to 18.8% for Alberta. The median age is 36.4 years, 0.1 years younger than the provincial median age of 36.5 years. The workforce population (population between 15 and 64 years) was 78.2% of the total population. The gender ratio of the population is weighted slightly in favor of males (51.7% male) (Statistics Canada 2012).

In 2011, 11.4% of the population of the town identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

The Town of Hinton identified safety as a primary issue related to the Project. There is infrastructure abutting the existing route in certain areas and if a spill or incident were to occur, many people would need to be evacuated. The Town of Hinton's interest is to ensure that emergency management is practiced with Trans Mountain (Kreiner pers. comm.).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified:

- Interest in developing outdoor quality of life (*e.g.,* mountain bike park) (Kreiner pers. comm.).
- Increased municipal taxes are appreciated.
- The Cache Percotte Forest, located approximately 3.5 km south of the proposed pipeline corridor, has high heritage value and gets its name from a smallpox outbreak that killed a number of individuals in the area. The area has the potential for grave sites (Engerdahl pers. comm.).
- The importance of emergency and spill preparedness, but recognizing that the pipeline presents a smaller risk than rail or road accidents related to oil transport (Kreiner pers. comm.).
- Limits and costs for municipal planning, as future developments need to consider the presence of the pipeline (Kreiner pers. comm.).
- Interest in community education (*e.g.,* Foothills Research Institute as potential resource) (Kreiner, Karmacharya pers. comm.).
- The presence of temporary workers and a construction camp could result in social issues and disruptive behaviour when workers come into town (Knight pers. comm.).
- Construction activity and an increase in workers can result in increased traffic and collisions (Knight pers. comm.).
- Potential overlap with the planned Vista Coal Mine Project in the area.

Overall the Town of Hinton did anticipate the Project will have a large impact because the town is growing and the portion of the Project within the Town of Hinton boundaries is relatively small (Kreiner pers. comm.).

Hinton RCMP identified that in the past there was more drug activity in the town, but that has decreased in recent years. The Project is not a high-risk project for the RCMP and if issues do result, Hinton RCMP anticipates having the capacity to respond to them. Most issues are anticipated to be alcohol induced (*e.g.,* impaired driving) (Knight pers. comm.).

6.3 Jasper National Park Region

6.3.1 Regional Overview

6.3.1.1 Population and Demographics

In 2011, the total population of the Jasper National Park Region was 4,085, a 4.8% decrease from 2006. Table A-1 in Appendix A summarizes select population characteristics for municipalities and Aboriginal communities in the region. As evidenced by the percent change in population from 2006 to 2011, the Municipality of Jasper is declining in population. In the Jasper National Park Region, 2.2% of the population identifies themselves as Aboriginal. There are several IRs and communities in this region; however, no reserves are crossed by the proposed pipeline corridor. In 2011, the Municipality of Jasper had 175 internal migrants (5.1% of the total mobility population) and 15 external migrants (0.4% of the

total population). Approximately 3.3% of the population had moved from another province in the previous two years. Table A-3 in Appendix A summarizes select population mobility characteristics for municipalities and Aboriginal communities in the region.

Shadow populations are characterized by a large component of the temporary population living in project accommodations, hotels and motels, and campgrounds but also living in permanent residences. The percentage of private dwellings occupied by usual (permanent) residents compared to the total number of private dwellings can be an indication of the presence of a shadow population. In the Jasper National Park Region in 2011, the percentage of private dwellings occupied by permanent residents was 86.6%. Based on this data the shadow population in the Jasper National Park Region is relatively low. However, average percentage of private dwellings occupied by permanent residents does not account for the shadow population present in temporary accommodations. Section 8.4.3 provides information on housing (temporary and permanent accommodations) in the Jasper National Park Region.

Population projections are based on CDs, the boundaries of which do not directly mirror those of the Jasper National Park Region as described in this report. In 2011, the total population of CD15 - which includes all communities in Jasper and Banff National Parks — was 40,032. The medium projected population for CD15 in 2041 is 47,110 (Alberta Treasury Board and Finance 2012).

6.3.1.2 Income Levels and Distribution

In 2011, the median income for Municipality of Jasper was approximately $35,000. Males in the Jasper National Park Region had a median income of $44,991, compared to $26,186 for females. In 2011, the median income of those working full-year, full-time and with employment income was approximately $50,000 for the Jasper National Park Region (Statistics Canada 2013a).

In 2011, the Municipality of Jasper had 5.1% government transfer as a percent of income. Government transfer refers to all cash benefits received from the federal, provincial, territorial or municipal governments (*e.g.,* Old Age Security, Employment Insurance) (Statistics Canada 2013a). Table A-5 in Appendix A summarizes select income characteristics for municipalities and Aboriginal communities in the region.

6.3.1.3 Aboriginal Culture

Jasper National Park is the most sparsely populated region in the Socio-Economic RSA. There are no IRs or Métis Settlements in the region, and one Aboriginal community located in region has been identified as potentially affected by the Project (asserted traditional territories of potentially affected Aboriginal communities may be crossed by more than more than one socio-economic region). People of Aboriginal identity represent approximately 2.2% of the population in the Jasper National Park Region. The Aboriginal communities in this region historically used or presently use Crown lands to maintain a traditional lifestyle. Current land tenure and land use limits the practice of traditional activities on lands within and adjacent to the Jasper Pump Station.

Detailed overviews and a list of Aboriginal communities and IRs are found in Section 5.0 and in the Traditional Land and Resource Use Technical Report of Volume 5D.

6.3.1.4 Community Way of Life

The Jasper National Park Region includes one community and urban service centre, the Municipality of Jasper. Outdoor recreation opportunities and activities are plentiful in the region, and community identity is based strongly on its role as a year-round tourism destination in one of Canada's national parks. Section 7.5.3 further discusses outdoor recreational use in the Jasper National Park Region.

The Municipality of Jasper was a construction hub during the TMX Anchor Loop Project and has therefore experienced pipeline construction activity. Local officials indicated that construction of the TMX Anchor Loop Project had a notable impact on the Municipality of Jasper. In addition to economic benefits associated with the presence of a temporary workforce, the housing market experienced substantial price

increases. Certain residents were affected by lack of housing and increased housing prices and were displaced or left town. Many services could not retain staff due to a lack of housing availability (Waterworth pers. comm.).

Table 6.3-1 provides information on crime rates in the Jasper National Park Region based on incidents per 1,000 people. Between 2007 and 2012, rates of violent crime declined by approximately 11% and rates of property crime declined by approximately 41%. During this period, the rate of criminal code traffic violations declined by almost 17%, while the rate of drug violations increased by approximately 24%.

From 2007 to 2009 when the TMX Anchor Loop Project construction occurred, certain crime rate categories increased year to year while others declined. For example, between 2007 and 2008, the rate of drug violations declined by approximately 34%, while criminal code traffic violations increased by approximately 41%. However the rate of criminal code traffic violations then declined approximately 35% between 2008 and 2009. The rate drug violations generally declined during the 2007 to 2009 period; a decline of approximately 34% occurred between 2007 and 2008, and a decline of approximately 40% occurred between 2008 and 2009. The rate of drug violations, however, increased over 160% between 2009 and 2010. Crime rates in all categories show variability in the 2010–2012 period after the conclusion of construction activity related to the TMX Anchor Loop Project, suggesting that other factors beyond the presence of major construction contribute to crime variability. Table 6.3-2 presents crime rates for Jasper annually between 2002 and 2012.

TABLE 6.3-1

CRIME RATES, JASPER NATIONAL PARK REGION 2007 TO 2012

Police Service Area	Rate per 1,000 people														
	Total Violent Criminal Code Violations			Total Property Crime Violations			Total Other Criminal Code Violations (Excluding Traffic)			Total Criminal Code Traffic Violations			Total Drug Violations		
	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change
Jasper RCMP rural	21.5	19.2	-10.7%	93.1	55.2	-40.7%	37.6	30.5	-18.9%	20.2	16.8	-16.8%	18.9	23.5	24.3%

Source: Statistics Canada 2013c

TABLE 6.3-2

CRIME RATES, JASPER NATIONAL PARK REGION 2002 TO 2012

Jasper RCMP, Rural – Violation Category		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total violent Criminal Code violations	Rate per 1,000 population	--	16.0	14.7	24.6	24.4	21.5	19.4	12.3	9.6	18.1	19.2
	Percentage change from previous year	--	0%	-8.1%	67.3%	-0.8%	-11.9%	-9.8%	-36.6%	-22.0%	88.5%	6.1%
Total property crime violations	Rate per 1,000 population	--	116.5	89.0	85.5	84.1	93.1	63.6	58.8	51.7	47.6	55.2
	Percentage change from previous year	--	0%	-23.6%	-3.9%	-1.6%	10.7%	-31.7%	-7.5%	-12.1%	-7.9%	16.0%
Total other Criminal Code violations (excluding traffic)	Rate per 1,000 population	--	43.7	45.8	44.6	40.4	37.6	48.2	49.4	35.3	27.9	30.5
	Percentage change from previous year	--	0%	4.8%	-2.6%	-9.4%	-6.9%	28.2%	2.5%	-28.5%	-21.0%	9.3%
Total Criminal Code traffic violations	Rate per 1,000 population	--	20.4	17.8	21.0	21.5	20.2	28.4	18.5	10.0	13.0	16.8
	Percentage change from previous year	--	0%	-12.7%	18.0%	2.4%	-6.0%	40.6%	-34.9%	-45.9%	30.0%	29.2%
Total drug violations	Rate per 1,000 population	--	11.9	17.6	18.0	19.7	18.9	12.4	7.4	19.6	17.5	23.5
	Percentage change from previous year	--	0%	47.9%	2.3%	9.4%	-4.0%	-34.4%	-40.3	164.9%	-10.7%	34.3%

Source: Statistics Canada 2013c

Note: Data were not reported for 2002.

No key community events and assets were identified in the region that could interact with the Project.

Key socio-cultural interests and issues in the region that have been identified by stakeholders related to the Project include:

- the community is very environmentally conscious (Jenkins pers. comm.);
- opportunities for local businesses, workers, and contractors; and
- the potential for crowding in housing, service pressures, and social issues related to temporary workers.

6.3.2 Communities and Regions in the Project Footprint

This subsection presents information on communities and regions in the Project Footprint of the Jasper National Park Region. Selected population, mobility and income statistics are located in Table A-1, A-3 and A-5 in Appendix A.

Improvement District No. 12

Improvement District No. 12 (ID No. 12) is crossed by two existing Trans Mountain pipelines, including a section planned for reactivation. ID No. 12 is located in Jasper National Park and is approximately 25 km west of the Town of Hinton on Highway 16. Services in improvement districts are administered by a local board of trustees and improvement district staff. Improvement districts may exist within regional municipalities, operating separately from them. ID No. 12 encompasses all of Jasper National Park except for the area administered by the Municipality of Jasper.

Census data for ID No. 12 includes data for rural areas. It does not include data for the Municipality of Jasper. In 2011, ID No. 12 had a population of approximately 34, which is a 41.7% increase since 2006. The provincial population increased 10.8% over the same period. In order to protect the confidentiality of individual respondents' personal information, Statistics Canada suppresses data for any geographical area with a population of less than 40 persons. Therefore, only total population counts are available for ID No. 12 (Statistics Canada 2012). Aboriginal identity data is not available for ID No. 12.

Municipality of Jasper

The Municipality of Jasper is crossed by two existing Trans Mountain pipelines, including a section planned for reactivation. The Jasper Pump Station is located within the Municipality of Jasper. The Municipality of Jasper is located in Jasper National Park and is approximately 80 km southwest of Hinton on Highway 16. Proposed work activity on the Jasper Pump Station and the reactivated pipeline segment is anticipated to be based from the Hinton construction hub.

The proposed pipeline corridor in the Municipality of Jasper is located within the boundaries of the Jasper National Park of Canada Management Plan. This plan provides direction and strategies for the park's mandate of resource protection, enhanced visitor experience, strengthening cultural resource management and public appreciation. This plan specifies considerations pertaining to pipeline construction within the land use zones crossed by the Project. The plan states that development in the park typically occurs in valleys, which are the most productive areas in the park. As such, to ensure that ecological integrity is maintained, Parks Canada limits development in these areas and defines the physical footprint, types and intensity of developments permitted in the park. The plan also states the importance of stewardship and restoration along pipeline corridors (Parks Canada 2010).

The Jasper Community Sustainability Plan (JCSP) (2011) includes a land use plan and addresses economy, culture, society, environment and governance (Municipality of Jasper and Parks Canada 2011). The JCSP commits the community to reducing its dependency on natural resources and being a leader in environmental stewardship but does not specifically mention pipelines. The JCSP does discuss the cumulative effects of linear development on the area in the past and refers the reader to the Jasper National Park of Canada Management Plan (Municipality of Jasper and Parks Canada 2011).

The Municipality of Jasper's local economy is based on tourism (Municipality of Jasper 2013, Waterworth pers. comm.). Construction for the TMX Anchor Loop Project had a major impact on the Municipality of Jasper. The housing market was most affected (see Section 8.4.3). The Municipality of Jasper is used to transient populations, many of which are seasonal employees related to the tourism sector.

In 2011, the Municipality of Jasper had a population of approximately 4,050, which is a 5% decrease since 2006. The provincial population increased 10.8% over the same period. Approximately 13.6% of the population is between 0 and 14 years of age compared to 18.8% for Alberta. The median age is 34.8 years, 1.7 years younger than the provincial median age of 36.5 years. The workforce population (population between 15 and 64 years) was 84.7% of the total population. The gender ratio of the population is weighted slightly in favor of males (51.6% male) (Statistics Canada 2012).

In 2011, 2.2% of the population of the municipality identified as Aboriginal. This compares to 6.2% for the province of Alberta (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- A small number of workers residing in town would not have a noticeable effect (Waterworth pers. comm.).
- There is a strong environmental community in the municipality; re-activating the existing pipeline will be of interest to residents (Jenkins pers. comm.).
- Pipeline integrity and safety is a key interest (Mitchell pers. comm.).
- The Project will have carry over issues from the Enbridge Northern Gateway Project because Enbridge is consulting with the Municipality of Jasper as well (Deagle pers. comm.).

6.4 Fraser-Fort George/Thompson-Nicola Region

6.4.1 Regional Overview

6.4.1.1 Population and Demographics

In 2011, the total population of the Fraser-Fort George/Thompson-Nicola Region was approximately 129,000, a 4.6% increase from 2006. The density of the population is variable through the region; much of the population is located in the regional centre of the City of Kamloops, but there are smaller cities and districts as well as very small villages and hamlets within the region. Table A-2 in Appendix A summarizes select population characteristics for municipalities and Aboriginal communities in the region. As evidenced by the percent change in population from 2006 to 2011, the District of Barriere is growing most rapidly in the region. Conversely, Sun Peaks Mountain Resort Municipality is declining in population. Of the communities along the proposed pipeline corridor, the City of Kamloops is growing the most rapidly, with a 6.6% increase in population from 2006 to 2011. In the Fraser-Fort George/Thompson-Nicola Region, 10.6% of the population identifies themselves as Aboriginal. Numerous IRs and communities are located in this region, and the proposed pipeline corridor crosses three IRs.

In 2011, population mobility in the Fraser-Fort George/ Thompson-Nicola Region varied depending on the community. The Neskonlith IR had the highest percentage of internal migrants (13.0% of the total population) and the City Kamloops 1 IR had the highest percent of external migrants (1.6% of the total population). Of the municipal areas crossed by the Project, the District of Clearwater had the highest proportion of internal migrants at approximately 9.0% of the total mobility population, most of which had moved from other parts of BC. Table A-4 in Appendix A summarizes select population mobility characteristics for municipalities and Aboriginal communities in the region.

Shadow populations are characterized by a large component of the temporary population living in project accommodations, hotels and motels and campgrounds but also living in permanent residences. The

percentage of private dwellings occupied by usual (permanent) residents compared to the total number of private dwellings can be an indication of the presence of a shadow population. In the Fraser-Fort George/Thompson-Nicola Region in 2011, the average percentage of private dwellings occupied by permanent residents was 80.0%. In most communities and rural areas, 75% to 94% of private dwellings were occupied by permanent residents. The community with the lowest percentage was Sun Peaks Mountain Resort Municipality with 16.1%. This is likely due to the community's focus on recreational activities. Based on this data the Fraser-Fort George/Thompson-Nicola Region has a highly variable shadow population ranging from high, in Sun Peaks Mountain Resort Municipality, to low in the City of Kamloops (94.8%). Shadow population is known to fluctuate and average percentage of private dwellings occupied by permanent residents does not account for the shadow population present in temporary accommodations. Section 8.4.4 provides information on housing (temporary and permanent accommodations) in the Fraser-Fort George/Thompson-Nicola Region.

Population projections for the TNRD as a whole (extending beyond the area of the RSA) are 150,000 in 2023 and 160,000 in 2033 (BC Stats 2013). Provincial and national in-migration to the Thompson Okanagan region has historically been positive, and is expected to grow. A strong manufacturing base, as well as opportunities in the forestry and mining sectors and agriculture and tourism, influence migration flows to and from this region (BC Stats 2011).

6.4.1.2 Income Levels and Distribution

In 2011, the median income for Fraser-Fort George/Thompson-Nicola Region was approximately $24,400. The median income ranged from $32,829 in the IR of Kamloops 1 to $14,390 in Nicola Mameet 1. Gender differentials in income varied amongst communities in the Fraser-Fort George/Thompson-Nicola Region. In total, males in the Fraser-Fort George/Thompson-Nicola Region had a median income of $35,438, compared to $19,824 for females. In 2011, the median income of those working full-year, full-time and with employment income was approximately $46,200 for the Fraser-Fort George/Thompson-Nicola Region. It ranged from $24,830 in the Village of McBride to $57,389 in Electoral Area J of the TNRD (Statistics Canada 2013a).

In 2011, the Village of McBride and Nicola Mameet 1 had the highest government transfer as a percent of income (29.9%) and the Municipality of Sun Peaks had the lowest (9.6%). Government transfer refers to all cash benefits received from the federal, provincial, territorial or municipal governments (*e.g.,* Old Age Security, Employment Insurance) (Statistics Canada 2013a). Table A-6 in Appendix A summarizes select income characteristics for municipalities and Aboriginal communities in the region.

6.4.1.3 Aboriginal Culture

Aboriginal people living both on and off reserve represent a unique demographic in the Fraser-Fort George/Thompson-Nicola Region. This region includes 49 IRs (not all populated), and 15 Aboriginal communities located in region may be affected by the Project (asserted traditional territories of potentially affected Aboriginal communities may be crossed by more than more than one socio-economic region). People of Aboriginal identity represent approximately 10.6% of the population in the Fraser-Fort George/Thompson-Nicola Region (Statistics Canada 2013a).

Key traditional land uses in the region include hunting, fishing, trapping, gathering (food and medicinal plants, plants used for traditional crafts) and the ceremonial use or maintenance of holy sites as well as production of traditional crafts, regalia, games and instruments. Bands conduct pow-wows, long house ceremonies and sweat lodges. Salmon fishing is of particular cultural and economic importance to the people in the region, historically being a tremendously important food source and item used in trade and ceremonial practices. Fishing is carried out for both cultural and subsistence purposes. The Aboriginal communities in the region also contribute to local industry, working as contractors and business owners in oil and gas, forestry, tourism and development. Communities have demonstrated a desire for training and work experience in these industries. Unemployment rates for Aboriginal communities in the region are largely not reported; however, where data is available, communities show high rates of unemployment and relatively low labour force participation rates. Given the high level of urbanization and the history of development in the region, there is a relatively high degree of social and economic integration between

Aboriginal and non-Aboriginal populations in the region. The low levels of the use of Aboriginal language by those of Aboriginal identity reflect this integration. For example, in the Kamloops census agglomeration area (City of Kamloops and surrounding communities, IRs and rural areas) in 2006, approximately 8.7% of the Aboriginal identity population indicated knowledge of an Aboriginal language, and approximately 1.4% of the Aboriginal identity population indicated that the language spoken most often at home was an Aboriginal language (Statistics Canada 2007). Use and knowledge of Aboriginal languages tends to be higher on-reserve.

Detailed overviews and a list of Aboriginal communities and IRs are found in Section 5.0 and in the Traditional Land and Resource Use Technical Report of Volume 5D.

6.4.1.4 Community Way of Life

The Fraser-Fort George/Thompson-Nicola Region includes a range of communities, from a larger urban service centre, the City of Kamloops, to smaller communities such as the Village of Valemount, District of Clearwater and the City of Merritt. Various unincorporated communities such as Blue River and Avola are also located in the Fraser-Fort George/Thompson-Nicola Region and are crossed by the proposed pipeline corridor. Outdoor recreation opportunities and activities such as hiking and skiing are plentiful in the region, in both urban areas and unincorporated areas; tourism and recreation opportunities are important parts of the local cultural identity in many communities. Section 7.5.4 further discusses outdoor recreational use in the Fraser-Fort George/Thompson-Nicola Region.

Various communities in the region have experienced temporary population fluctuations from the construction of major projects. As a larger regional centre with a more diverse economy, the City of Kamloops is familiar with temporary construction crews and local businesses anticipate benefits from temporary workers, particularly temporary accommodation providers such as hotels and motels (Morris pers. comm.). The Village of Valemount was a construction hub during the TMX Anchor Loop Project, housing many workers during the construction period. Feedback from technical discussions noted the following interfaces with community way-of-life during the project: local economic benefits and spin-offs; increased rental rates; vacant hotel rooms that were blocked for crews; pressures on grocery stores; and the emergence of escort services. The City of Merritt has experience with temporary workers related to transmission development and highway development projects, and welcomes business opportunities associated with such projects.

The City of Kamloops Social Plan has a goal of enhancing the well-being of the residents of Kamloops. The plan focuses on housing and homelessness; safe places, alternative transportation and environmental health; youth issues; Aboriginal community; building social agencies and community capacity; children and families; and health and addictions. The plan aims to build on work to address community well-being issues already begun by the city (City of Kamloops 2009).

For most police service areas in the region, the incident rate of violent crime has decreased between 2007 and 2012, the exception being Valemount RMCP that had slight increase (1.5%) during this time period. Property crimes have also decreased across police services in the region. For example, data indicates that property crime rate decreases ranged from approximately -16% in Valemount between 2007 and 2012 to approximately -40% in municipal areas serviced by the Kamloops RCMP. Criminal code traffic violation rates show greater variability across the region. The incident rate of criminal code traffic violations decreased approximately 40% in municipal areas policed by the Merritt RCMP, while it increased over 95% in the Valemount rural police service area during the same period. Kamloops and Merritt police service areas show increases in drug violation rates between 2007 and 2012, while Valemount and Clearwater show notable decreases (approximately -41% and -54% respectively). Table 6.4-1 provides information on crime rates for key police service areas in the Fraser-Fort George/Thompson-Nicola Region between 2007 and 2012, calculated based on incidents per 1,000 people.

TABLE 6.4-1

CRIME RATES, FRASER-FORT GEORGE/THOMPSON-NICOLA REGION 2007 TO 2012

Police Service Area	Rate per 1,000 people														
	Total violent Criminal Code Violations			Total Property Crime Violations			Total Other Criminal Code Violations (Except Traffic)			Total Criminal Code Traffic Ciolations			Total Drug Violations		
	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change
Valemount, RCMP, rural	18.5	18.8	1.6%	62.6	52.9	-15.5%	22.1	30.6	38.5%	4.8	9.4	95.8%	43.7	25.9	-40.7%
Clearwater, RCMP, rural	16.7	12.9	-22.8%	42.5	31.8	-25.2%	17.5	20.0	14.3%	9.2	5.8	-37.0%	31.1	14.4	-53.7%
Kamloops, RCMP, municipal	27.4	20.9	-23.7%	97.4	58.2	-40.2%	28.7	21.1	-26.5%	6.1	4.2	-31.1%	6.5	9.9	52.3%
Merritt, RCMP, municipal	41.8	39.7	-5.0%	126.5	85.8	-32.2%	75.6	41.7	-44.8%	11.0	6.6	-40.0%	12.9	18.9	46.5%
Merritt, RCMP, rural	110.0	94.7	-13.6%	47.1	46.6	0.0%	24.7	14.6	-40.0%	13.0	15.1	15.4%	6.77	23.5	242.9%

Source: Statistics Canada 2013d

Note: Some detachments report data for municipal and rural areas separately. Statistics Canada did not show data for some police service areas along the proposed pipeline corridor, including T'Kumlups and Kamloops (rural).

Key community events and assets that have been identified in the region that could interact with the Project include the following.

- In the District of Clearwater, the proposed pipeline corridor crosses the field of an elementary school (RK 720.2 to RK 720.5) and the field of a middle school (RK 1097.5 to RK 1097.8).
- Near the Community of Little Fort, the proposed pipeline corridor crosses the Little Fort Cemetery (approximately RK 756.2 to RK 756.4).
- Community trails are crossed in the Jacko Lake area of the City of Kamloops.
- Lac du Bois Grasslands Protected Area is crossed in the City of Kamloops.
- Winter tourist season is highly valued in the northern parts of the region (*e.g.,* in Valemount and Blue River), while summer tourist season is highly valued in the southern parts of the region (*e.g.,* Clearwater, Kamloops, and Merritt).

Key socio-cultural interests and issues in the region that have been identified by stakeholders related to the Project include the following.

- Opportunities for local businesses, workers, and contractors.
- Economic spin-offs related to temporary Project workforce residing in regional communities.
- Ensuring the protection of recreational trails and areas from over-use due to temporary workers.
- Potential for crowding in housing, service pressures, and social issues related to temporary workers.
- Construction related noise and traffic congestion in smaller communities and the potential to disturb tourists.
- Protection of land, vegetation, watercourses and wildlife used for traditional Aboriginal livelihood and cultural purposes.

6.4.2 Communities and Regions in the Project Footprint

This subsection presents information on communities and regions in the Project Footprint of the Fraser-Fort George/Thompson-Nicola Region. Selected population statistics are located in Tables A-2, A-4 and A-6 in Appendix A.

Regional District of Fraser-Fort George

The Project is located in the RDFFG, Area H, for approximately 59.4 km. The Village of Valemount is the service centre within this area. The following pump stations are located in the RDFFG: the Hargreaves Pump Station (RK 489.6), Rearguard Pump Station (RK 498.3) and Albreda Pump Station (RK 545.4). A portion of the Hinton to Hargreaves reactivated pipeline segment is in the RDFFG. The reactivated pipeline segment parallels the existing, active Trans Mountain pipeline; the existing TMPL easement is 18 m wide.

The proposed pipeline corridor in the RDFFG is located within the boundaries of the Robson Valley-Canoe Upstream OCP. The purpose of this plan is to state the broad land use objectives and policies of the Regional Board to guide decisions on planning and land use management for the Robson Valley-Canoe Upstream area within the RDFFG, as set out in the *Local Government Act.* This plan does not specify restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (RDFFG 2006).

The RDFFG has an abundance of natural resources including forests, oil and gas. Unincorporated communities located in Electoral Area H are listed in Table 6.4-2. The proposed pipeline corridor crosses

the Unincorporated Community of Albreda (approximately RK 548.7). The community of Albreda is located approximately 25 km south of the Village of Valemount in the RDFFG.

TABLE 6.4-2

UNINCORPORATED COMMUNITIES LOCATED IN THE REGIONAL DISTRICT OF FRASER-FORT GEORGE ELECTORAL AREAS IN THE SOCIO-ECONOMIC REGIONAL STUDY AREA

Electoral Area	Unincorporated community
H	• Albreda (locality) • Cedarside • Dome Creek • Dunster • Lamming Mills • Tête Jaune Cache

Source: BC Stats 2011b

Notes: Unincorporated communities are not necessarily crossed by the proposed pipeline corridor.

Census data for Electoral Area H of the RDFFG includes data for rural areas and the unincorporated communities listed in Table 6.4-2. It does not include data for municipalities. In 2011, Electoral Area H of the RDFFG had a population of approximately 1,877, which is an 11.3% decrease since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 14.1% of the population is between the ages of 0 and 14 years of age compared to 15.4% for BC. The median age is 49.6 years, 7.7 years older than the provincial median age of 41.9 years. The workforce population (population between 15 and 64 years) is 74.5% of the total population. The gender ratio of the population is weighted slightly in favour of males (51.4% male) (Statistics Canada 2012).

In 2011, 7.9% of the population of the electoral area identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- Concern was raised regarding the housing and accommodation of temporary construction workers, and ensuring that a detailed housing strategy is used (McEachen pers. comm.).
- Interest in routing, particularly to avoid planned residential developments between approximately RK 514 and RK 523 (McEachen pers. comm.).
- Concern over environmentally sensitive areas (*e.g.,* Cranberry Marsh – not crossed by the proposed pipeline corridor) (Soklic pers. comm.).
- Concern was raised regarding limited labour availability, with reference to other industrial projects in northern BC (McEachen pers. comm.).

Village of Valemount

The Village of Valemount is located within the boundaries of RDFFG. The proposed pipeline corridor is located 0.4 km from the Village of Valemount. The Village of Valemount has been identified as a construction hub by Trans Mountain; as such it is considered to be within the Footprint of Project activities.

In 2011, the Village of Valemount had a population of approximately 1,020, which is a 0.2% increase since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 16.2% of the population is between the ages of 0 and 14 years of age compared to 15.4% for BC. The

median age is 44.3 years, 2.4 years older that the provincial median age of 41.9 years. The workforce population (population between 15 and 64 years) was 74.0% of the total population. The gender ratio of the population is weighted slightly in favor of females (51.5% female) (Statistics Canada 2012).

In 2011, 16.0% of the population of the village identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

The Village of Valemount was a construction hub during the construction of the TMX Anchor Loop Project, and thus has experience with temporary workers and other activities associated with pipeline and facilities construction. During the TMX Anchor Loop Project, construction workers contributed notably to the local economy; over a six-month construction period it was estimated that over $7.3 million was spent in the local economy related to food, lodging and retail services (The Valley Sentinel 2008). For example, it was noted during consultations related to the expansion Project that during the TMX Anchor Loop construction there were two grocery stores to service the increased demand; currently there is only one grocery store (Latimer pers. comm.).

Some adverse socio-cultural issues were also noted related to the TMX Anchor Loop Project. During the construction period, damage occurred in a wetland area near Clemina Creek related to work crews' use of ATVs; it was estimated that up to 500 ATVs used the area. It was noted that crews coming from Alberta were not familiar with the local terrain and how it would be sensitive to the use of recreational vehicles. It resulted in conflicts with Aboriginal communities and local residents and recreation users. Work has been conducted to restore the area since 2007 (Pawliuk pers. comm.). Other issues noted included grocery stores at times running out of supplies, pressure on housing and parking, and increases in presence of certain social issues (Yanciw, Townsend pers. comm.).

Crimes rates in the Village of Valemount show variability, with some violation categories increasing in incident rates between 2007 and 2012 while others decreasing. As noted in Table 6.4-1, total drug violations have decreased by approximately 41% between 2007 and 2012, and property crime violation rates have decreased by approximately 14% during the same period. The criminal code traffic violation rate has increased over 96% between 2007 and 2012 and the rate of violent crimes increased marginally (1.5%). From 2007 to 2009 when construction of the TMX Anchor Loop Project took place (Table 6.4-2), the rates of occurrence in some violation categories increased notably during this period while some were more variable. For example, the rate of violent crimes increased by about 29% between 2007 and 2008 and then increased approximately 40% between 2008 and 2009, then decreased by approximately 55% between 2009 and 2010. Property crimes rates and other criminal code violations (excluding traffic) both increased between 2007 and 2008, but then declined between 2008 and 2009. The rate of drug violations declined by approximately 63% between 2007 and 2008, and then rose marginally (approximately 1%) between 2008 and 2009. Table 6.4-3 provides detail on crime rates per 1,000 people between 2002 and 2012 for the Valemount police service area.

TABLE 6.4-3

CRIME RATES, VILLAGE OF VALEMOUNT 2002 TO 2012

Valemount RCMP Rural – Violation Category		2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total violent Criminal Code violations	Rate per 1,000 population	34.7	27.3	25.8	24.1	25.2	18.5	23.8	33.3	15.0	13.7	18.8
	Percentage change from previous year	-	-21.3%	-5.5%	6.6%	4.6%	26.6%	28.6%	39.9%	-55.0%	-8.7%	37.2%
Total property crime violations	Rate per 1,000 population	97.6	99.1	60.1	65.2	61.3	61.6	68.3	66.0	44.3	52.3	52.9
	Percentage change from previous year	-	1.5%	-39.4%	8.5%	-6.0%	0.5%	10.9%	-3.4%	-32.9%	18.1%	1.1%
Total other Criminal Code violations	Rate per 1,000 population	32.2	31.6	22.3	31.7	27.6	22.1	28.5	25.2	28.7	28.5	30.6
	Percentage change from previous year	-	-1.9%	-29.4%	42.2%	-12.9%	-19.9%	29.0%	-11.6%	13.9%	-0.7%	7.4%
Total Criminal Code traffic violations	Rate per 1,000 population	25.0	12.9	21.8	9.4	7.8	4.8	15.4	16.8	16.2	13.7	9.4
	Percentage change from previous year	-	-48.4%	69.0%	-56.9%	-17.0	-38.5%	200.8%	9.1%	-3.6%	-15.4%	-31.4%
Total drug violations	Rate per 1,000 population	85.3	87.9	30.4	15.3	20.0	43.7	16.0	16.2	18.0	17.8	25.9
	Percentage change from previous year	-	3.0%	-65.4%	-49.7%	30.7%	118.5%	-63.4%	1.3%	11.1%	-1.1%	45.5%

Source: Statistics Canada 2013d

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following socio-cultural issues were identified:

- Economic and employment opportunities for local residents.
- Opportunities to use temporary sites that were used during the TMX Anchor Loop Project, which are still serviced with power (LaBoucane pers. comm.).
- The importance of protecting trails and protecting work to date (*e.g.,* relationship development) on exploring development of new trails (Pawliuk pers. comm.).
- The importance of community education about the Project (*e.g.,* pipelines, tanker traffic) (Townsend pers. comm.).
- Importance of taking measures to prevent spreading of weeds and invasive species (*e.g.,* cleaning the equipment) (Yanciw pers. comm.).
- Increased demand on local services during construction, as well as resulting opportunities.
- The importance of communication and positive community relations was identified at the Valemount Community Workshop.
- At the Valemount Community Workshop it was noted that the Village of Valemount is a community-oriented place, and that community members would prefer worker integration.

Thompson-Nicola Regional District

The proposed pipeline corridor is located in the TNRD for approximately 442.3 km. The proposed pipeline corridor crosses Electoral Areas A, B, O, P, J, M and N within the TNRD. There are several pump stations located in the TNRD: the Chappel Pump Station (RK 581.3), Blue River Pump Station (RK 614.7), Finn Pump Station (RK 639.4), McMurphy Pump Station (RK 671.7), Black Pool Pump Station (RK 736.8), Darfield Pump Station (RK 769.0), proposed Black Pines Pump Station (RK 811.8), Kamloops Pump Station (RK 850.8), Stump Pump Station (RK 892.2) and Kingsvale Pump Station (RK 955.6) Although not crossed by the proposed pipeline corridor, Electoral Area L forms part of the Socio-Economic RSA. The Darfield to Black Pines reactivated pipeline segment is located in the TNRD. The reactivated pipeline segment parallels the existing, active Trans Mountain pipeline; the existing TMPL easement is 18 m wide.

The proposed pipeline corridor in the TNRD is located within the boundaries of the Eight Peaks SRMP and the Kamloops LRMP. The goal of the Eight Peaks SRMP plan is to establish resource management objectives that create conditions that support forestry, heli-skiing and other winter recreation activities while incorporating the principles of sustainability and stewardship. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (BC Ministry of Sustainable Resource Management 2003).

The goal of the Kamloops LRMP is to balance use of the land and resources which respects and accommodates all interests; protection and security of the land and resources for future generations; sustainable resource management practices which recognize the biological and physical limitations of the land and resources, and provide the highest and best values from these resources; compatibility with natural watershed processes and respect for the intrinsic value of nature; social and economic stability and vitality of local communities; and communication, education, and awareness of all values, including those of Aboriginal peoples. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (BC Integrated Land Management Bureau [ILMB] 1995).

Kamloops is the major service centre in the TNRD. The Project crosses the City of Kamloops for 33.7 km. Unincorporated communities located in Electoral Areas A, B, O, P, J, M and N are listed in Table 6.4-4.

TABLE 6.4-4

UNINCORPORATED COMMUNITIES LOCATED IN THE THOMPSON-NICOLA REGIONAL DISTRICT ELECTORAL AREAS IN THE SOCIO-ECONOMIC REGIONAL STUDY AREA

Electoral Area	Unincorporated community
A	• Birch Island • Blackpool • Stillwater • Vavenby
B	• Avola • Blue River
O	• Blucher Hall • Darfield • Little Fort
P	• Black Pines • McLure • Pinantan Lake • Vinsulla
J	• Cherry Creek • Savona
M	• Coyle • Douglas Lake • Lower Nicola • Nicola • Stump Lake
N	None

Source: BC Stats 2011b

Notes: Unincorporated communities are not necessarily crossed by the proposed pipeline corridor.

The proposed pipeline corridor crosses the Unincorporated Community (Community) of Blue River (approximately RK 615.8). The Community of Blue River is located approximately 230 km north of Kamloops on Highway 5. The Community of Blue River has been identified as a construction hub by Trans Mountain.

The Community of Blue River's main economic base is forestry and tourism (Communities of the North Thompson Valley 2012). Trans Mountain, CN, the Highways Department, Mike Weigele Helicopter Service (MWHS), two grocery stores and two service stations make up the local economy of the Community of Blue River. Mike Wiegele Helicopter Service has plans to create an interpretive centre about the history of the Community of Blue River and the valley. The interpretive centre would be an opportunity for Trans Mountain funding or partnership (Michelle Wiegele pers. comm.). Statistics for the Community of Blue River are included under the TNRD. At the Blue River Community Workshop it was noted that pipeline history is a part of the culture of Blue River. It was noted an annual baseball tournament occurs in Blue River on the August long weekend (Blue River Community Workshop).

The proposed pipeline corridor crosses the Community of Avola (approximately RK 655.7). The Community of Avola is located approximately 190 km north of Kamloops on Highway 5. The Community of Avola's main economic base is the forestry industry. Weyerhaeuser and Slocan lumber mills are the major employers (Communities of the North Thompson Valley 2012). Statistics for the Community of Avola are included under the TNRD.

The proposed pipeline corridor crosses the Community of Vavenby (approximately RK 698.0). The Community of Vavenby is located approximately 150 km north of Kamloops on Highway 5. The Community of Vavenby has been identified as a construction hub by Trans Mountain. The Community of Vavenby's main economic base is forestry, with a large portion of its residents working for Weyerhaeuser

or Slocan lumber mills in the community (Communities of the North Thompson Valley 2012). Statistics for the Community of Vavenby are included under the TNRD.

The proposed pipeline corridor crosses the Community of Blackpool (approximately RK 729.8). The Community of Blackpool is located approximately 110 km north of the City of Kamloops in the TNRD and is located in the RSA. Statistics for the Community of Blackpool are included under the TNRD.

Census data for Electoral Areas A, B, O, P, J, M, N and L of the TNRD includes data for rural areas and the unincorporated communities listed in Table 6.4-4. It does not include data for municipalities. In 2011, Electoral Areas A, B, O, P, J, M, N and L of the TNRD had a total population of 14,368, which is a 2.9% decrease since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 13.1% of the population is between the ages of 0 and 14 years of age compared to 15.4% for BC. The median age is 50.3 years, 8.4 years older than the provincial median age of 41.9 years. The workforce population (population between 15 and 64 years) is 74.2% of the total population. The gender ratio of the population is weighted slightly in favour of males (51.1% male) (Statistics Canada 2012).

In 2011, 12.1% of the population of the electoral areas identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- Communities are generally looking for investment, employment and development opportunities.
- Communities will prepare for work crews; but it is important that timing of construction activities is communicated to the communities so they can prepare (Macdonald pers. comm.).
- The importance of pipeline integrity and spill prevention (McQueen, Williams pers. comm.).
- Numerous linear disturbances in the North Thompson area and cumulative effects with regards to caribou migration and fish will be important to address (Hicks pers. comm.).
- Opportunities for staging and lay-down areas within certain communities (*e.g.,* Clearwater) (Storie pers. comm.).
- The importance on ongoing consultation and information-sharing about the Project, including at the political level (Gill pers. comm.).
- The importance of ongoing discussions with Aboriginal communities.
- The Little Fort Cemetery is crossed by the proposed pipeline corridor and it is of concern to residents. The approximate location of the cemetery is RK 756.6 (Storie pers. comm.). Concerns regarding disruption and access limitations were raised at the Clearwater Community Workshop.
- The importance of managing expectations o construction workers, residents and businesses was identified at the Blue River Community Workshop.
- Drug issues in the area, particularly along highway communities; residents are used to these issues with the tourist industry, because of the young and transient nature of tourism workers (Macdonald pers. comm.).
- There are several potential wind power projects (investigative permits), but these are not in the area of the proposed pipeline corridor (Williams pers. comm.).
- Weeds on the existing pipeline right-of-way are an issue for TNRD; TNRD provides funding to the Southern Interior Weed Management Committee (Storie, Gill, Hughes pers. comm.).

District of Clearwater

The proposed pipeline corridor crosses the District of Clearwater for 12.3 km (RK 714.3 to RK 726.6). The District of Clearwater is located approximately 127 km north of Kamloops on Highway 5. The District of Clearwater has been identified as a potential construction hub by Trans Mountain.

The proposed pipeline corridor in the District of Clearwater is located within the boundaries of the District of Clearwater OCP. This plan is intended to provide clear objectives and policies designed to implement community goals, which are based on sustainability principles. Objectives outlined in the OCP are grouped together under respective principles which include: environmental sustainability; social sustainability; cultural sustainability; and economic sustainability (District of Clearwater 2012).

Clearwater's main economic base is forestry. The main species harvested include fir, spruce and pine. Tourism is also a key economic driver, as a result of the community's location near Wells Gray Provincial Park (Communities of the North Thompson Valley 2012). Summer is the key tourist season. Some operators, including restaurants, close down during winter, but could stay open during winter if there was demand (Bradbury pers. comm.).

In 2011, the District of Clearwater had a population of approximately 2,331, which is a 4.8% increase since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 19.3% of the population is 0 to 14 years of age compared to 15.4% for BC. The population had a median age of 45.6 years, which is 3.7 years older than the provincial median age of 41.9 years. The workforce (population between 15 and 64 years) was 70.8% of the total population. The gender ratio of the population is weighted slightly in favour of females (50.2% females) (Statistics Canada 2012).

In 2011, 8.3% of the population of the district identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

Key community events and assets that have been identified in the community that could interact with the Project include the following.

- In the District of Clearwater, the proposed pipeline corridor crosses the field of an elementary school (RK 720.2 to RK 720.5) and the field of a middle school (RK 1097.5 to RK 1097.8).
- The North Thompson River Provincial Park is crossed by the proposed pipeline corridor from RK 725.5 to RK 725.9.
- At the Clearwater Community Workshop, it was noted that the existing TMPL right-of-way is used for access to businesses, residences and schools, as well as for recreational purposes in the District of Clearwater.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- Communities will prepare for work crews, but it is important that timing of construction activities be communicated to the communities so they can prepare.
- Opportunities for staging and lay-down areas.
- Restoration of the right-of-way and development of walking trails (Groulx pers. comm.).
- Land use/residential constraints.
- Minimizing disturbance to known parks, Simpcw First Nation sites; Raft River (which has use for agriculture, high fisheries value especially to Simpcw First Nation).
- Concerns related to drugs, alcohol, and social issues; the need to work diligently with youth.

City of Kamloops

The proposed pipeline corridor crosses the City of Kamloops for approximately 33.7 km (RK 823.2 to RK 857.3). The Kamloops Pump Station is located in the City of Kamloops, at RK 850.8. Kamloops is the largest municipality in the TNRD. The City of Kamloops has been identified as a potential construction hub by Trans Mountain. It is a transportation hub serviced by both national railways, four major highways and a regional airport.

The proposed pipeline corridor in the City of Kamloops is located within the boundaries of the Kamloops Airport Area Land Use and Development Plan, the Kamloops OCP and the Kamloops North OCP. The focus of the Kamloops Airport Area Land Use and Development Plan is to lay the groundwork to be used to promote the development of the Kamloops Airport area from a land use planning perspective. This plan does specify restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project. The proposed pipeline corridor crosses existing industrial and commercial zones. The Kamloops Airport Land Use Plan recognizes development restrictions to industrial and commercial activities due to the existing Trans Mountain pipeline right-of-way (Urban Systems Ltd. 2000).

The goal of the Kamloops OCP is to provide the best quality of life for all residents by: building strong and diverse neighborhoods; providing a variety of housing types; encouraging healthy and active lifestyles; supporting cultural and athletic pursuits; diversifying economic and educational opportunities; and maintaining sustainable environmental stewardship. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (City of Kamloops 2004).

The purpose of the Kamloops North OCP is to provide direction for future development and land uses within the area north of the City of Kamloops including: McLure, Vinsulla, Black Pines, Heffley Lake, and Sullivan (Knouff) Lake. The plan contains objectives, policies, and future land use designations adopted by the board of directors of the TNRD. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (City of Kamloops 2011).

Economic drivers in the city are forestry, mining, ranching and agriculture, and the major employers are Interior Health Authority, School District No. 73, Thompson Rivers University and Highland Valley Copper Mine (Venture Kamloops 2012). Kamloops is branded as ‘Canada’s Tournament Capital’: the city has a variety of facilities and venues and has been successful in hosting world-class tournaments (City of Kamloops 2013, Kwiatkowski pers. comm.). Historically, Kamloops was a resource-based community, but there has been a recent surge in diversification, particularly in tourism (Grover pers. comm.).

In 2011, the City of Kamloops’ population was 80,380, which is a 6.6% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 15.6% of the population is between 0 and 14 years of age similar to 15.4% for BC. The workforce population (population between 15 and 64 years) was 75.4% of the population in 2011. The median age is 41.5 years, which is similar to the provincial median age of 41.9 years. The population is weighted in favour of females (51.0% females) (Statistics Canada 2012).

In 2011, 7.5% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- Routing through the Westsyde neighbourhood due to existing developments, particularly between Westsyde Secondary School and Westsyde Road (at the time of writing, the proposed pipeline corridor re-routed to avoid the Westsyde neighbourhood).

- Residents in the Kamloops area have a strong connection with the Lac du Bois Grasslands Protected Area (Williams, Lishman pers. comm.). BC MFLNRO highlighted the importance of minimizing

disturbances and successful restoration with the use of native grasses (Reudink, Lishman pers. comm.).

- Disruption of single access roads by construction. Specifically, Mission Flats Road (access for Weyerhaeuser landfill, Kamloops landfill and wastewater treatment plant), Westsyde Road (single access for residents and other land users), Ord Road and Tranquille Road (access to airport and a truck route) (Fretz pers. comm.).

- Local businesses would prefer integration of temporary workers in the City of Kamloops (Lambright pers. comm.).

- It was noted that several hundred temporary workers could be absorbed in the city (Fretz pers. comm.).

- The city noted that the proposed Ajax Mine is in close proximity to the existing TMPL right-of-way (at the time of writing, the proposed pipeline corridor had been re-routed to avoid the proposed Ajax Mine Project). The anticipated timing of the Ajax Mine and the Project could overlap with the Project and have implications for the City of Kamloops regarding the presence of temporary workers (Fretz pers. comm.).

- The City of Kamloops is a tourism destination; therefore, any impacts on air quality or fresh water would subsequently impact Kamloops' tourism industry (Morris pers. comm.).

- Crossing of the North Thompson River (Fretz pers. comm.).

City of Merritt

The proposed pipeline corridor crosses the City of Merritt for approximately 4.6 km (RK 925.9 to RK 930.5). Merritt is the second largest municipality in the TNRD, located approximately 88 km south of Kamloops on Highway 5 (Coquihalla Highway). The City of Merritt has been identified as a potential construction hub by Trans Mountain.

The proposed pipeline corridor in the City of Merritt is located within the boundaries of the City of Merritt OCP. This plan provides an updated vision for the future of Merritt and a framework for carrying that vision forward to the year 2030. The OCP provides Council and the public with direction for development and the basis to evaluate proposals to ensure these proposals are consistent with the vision. The intent of this OCP is to provide an appropriate amount of planning direction while also providing flexibility to customize development to suit specific and unique circumstances within the city as well as facilitating creative and unusual development proposals. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (City of Merritt 2011a).

The economic drivers are forestry, agriculture, tourism and mining (City of Merritt 2007). The city aims to diversify the economy further by promoting tourism and entertainment events. Tourism in the City of Merritt is boosted by highway traffic volumes during the summer. Other sectors, such as health and education, also contribute to the local economy (City of Merritt 2011a).

In 2011, Merritt had a population of approximately 7,115, which is a 1.7% increase since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 17.3% of the population is 0 to 14 years of age compared to 15.4% of BC. The median age is 43.9 years, 2 years older than the provincial median age of 41.9 years. The workforce population (population between 15 and 64 years) was 70.9% of the total population. The gender ratio of the population is weighted slightly in favour of females (50.7% females) (Statistics Canada 2012).

In 2011, 10.9% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- The proposed pipeline corridor is in close proximity to the end of the Merritt Airport runway (O'Flaherty pers. comm.). Merritt has plans to expand the runway, but cannot expand southwards because of steep slopes and an existing road (O'Flaherty pers. comm.). The only direction they can expand is to the northeast (over the existing right-of-way) (O'Flaherty pers. comm.). The existing runway is 1,219 m (and needs to be 1,524 m for fire planes) (O'Flaherty pers. comm.).

- The city is open to future work crews and temporary workers; temporary workers are typically viewed by the community as a benefit to local businesses (Roline, Umpherson pers. comm.).

- The city is interested in potential economic benefits of the Project (Umpherson pers. comm.).

- Pipelines are preferred over trucks for transporting oil (Noble pers. comm.).

6.4.3 Communities and Regions in the Socio-Economic Regional Study Area

This subsection presents information on communities and regions in the Socio-Economic RSA of the Fraser-Fort George/Thompson-Nicola Region. Selected population, mobility and income statistics are located in Tables A-2, A-4 and A-6 in Appendix A.

Village of McBride

The Village of McBride is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The existing pipeline corridor is located approximately 75 km southwest of the Village of McBride (geodesic distance from approximately RK 506.0).

In 2011, the population of the Village of McBride was approximately 586, which is a 11.2% decrease from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 18.8% of the population was between 0 and 14 years of age, higher than the 15.4% for BC. The workforce population (population between 15 and 64 years) was 70.0% of the population in 2011. The median age was 44.3 years, which is higher than the provincial median age of 41.9 years. The population was weighted in favour of females (51.2% female) (Statistics Canada 2012).

In 2011, 7.9% of the population of the village identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

District of Barriere

The District of Barriere is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The existing pipeline corridor is located 12.8 km north from the District of Barriere (geodesic distance from RK 769.0). The District of Barriere is located on a portion of the existing Trans Mountain pipeline that was previously twinned, which is the Darfield to Black Pines segment to be reactivated as part of the Project. While the proposed pipeline corridor does not traverse through Barriere, the community is located on Highway 5 which will be a key transportation route during construction. The District of Barriere is located approximately 66 km north of Kamloops and was incorporated as a municipality in December 2007 (District of Barriere 2008).

The economic drivers include forestry, tourism and agriculture. Mineral development is an growing contributor to the economy, driver, with the anticipated production of mines, such as the Harper Creek Copper-Gold-Silver Project, in the vicinity of the community (District of Barriere 2009). There are two major mills located in the area: Gilbert Smith Forest Products (Barriere) and Darfield Building Products (Darfield), which is now called North River Log Homes. A growing trend for the District of Barriere is an increase in tourism (Communities of the North Thompson Valley 2012).

In 2011, the population of the District of Barriere was approximately 1,773, which is a 23.8% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately

13.8% of the population was between 0 and 14 years of age, lower than the 15.4% for BC. The workforce population (population between 15 and 64 years) was 64.9% of the population in 2011. The median age was 52.1 years, which is higher than the provincial median age of 41.9 years. The population was weighted in favour of females (50.2% female) (Statistics Canada 2012).

Aboriginal identity data is not available for the District of Barriere.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified:

- The Project may be constructed in the same timeframe as the Harper Creek Copper-Gold-Silver Project, though focused on different types of operators (Humphreys, Hannigan pers. comm.).
- The Project is anticipated to have minimal impact for the District of Barriere.
- There is ample housing availability, with both vacant lots and houses for sale (Hannigan pers. comm.).
- Trans Mountain has had positive interactions with the community (Humphreys pers. comm.).

Sun Peaks Mountain Resort Municipality

Sun Peaks Mountain Resort Municipality is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 20.7 km west from the Sun Peaks Mountain Resort Municipality (Sun Peaks) (geodesic distance from RK 815.0). Sun Peaks is located approximately 58 km northeast of Kamloops and was incorporated as a municipality in June 2010 (Sun Peaks Mountain Resort Municipality 2012). The municipality originated as a ski resort in 1961. The main economic driver is tourism. Sun Peaks Resort is a large destination ski resort with winter and summer activities including downhill and Nordic skiing, snowshoeing, ice skating, hiking, golf, cycling and camping (Sun Peaks Resort Corporation 2012).

In 2011, the population of Sun Peaks was approximately 371, which is a 12.9% decrease from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 10.8% of the population was between 0 and 14 years of age, lower than the 15.4% for BC. The workforce population (population between 15 and 64 years) was 84.9% of the population in 2011. The median age was 39.7 years, which is lower than the provincial median age of 41.9 years. The population was weighted in favour of males (52.6 % male) (Statistics Canada 2012).

In 2011, 11.3% of the population of the municipality identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

Village of Chase

The Village of Chase is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 39.0 km west from the Village of Chase (geodesic distance from RK 811.9). The Village of Chase is located approximately 55 km east of Kamloops. The main economic drivers are forestry, tourism and ranching (Chase 2007). The predominant employer for forestry is the Adams Lake Lumber Division of International Forest Products Ltd. The Village of Chase is adjacent to Little Shuswap and Shuswap Lakes, influencing the economic contribution of tourism. The Shuswap Lakes sees millions of sockeye salmon run annually from the South Thompson River. Raising livestock is the main agricultural activity in the Chase area (Chase 2007).

In 2011, the population of the Village of Chase was approximately 2,495, which is a 3.6% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 13.6% of the population was between 0 and 14 years of age, lower than the 15.4% for BC. The workforce population (population between 15 and 64 years) was 53.8% of the population in 2011. The median age was 48.3 years, which is higher than the provincial median age of 41.9 years. The population was weighted in favour of females (51.7% female) (Statistics Canada 2012).

In 2011, 11.5% of the population of the village identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

District of Logan Lake

The District of Logan Lake is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 26.4 km east from the District of Logan Lake (geodesic distance from RK 858). Logan Lake is located approximately 60 km southwest of Kamloops, and 50 km north of Merritt in the TNRD. The main economic driver is mining. Highland Valley Copper is the District's top employer (District of Logan Lake 2012).

In 2011, the District of Logan Lake's population was approximately 2,073, which is a 4.1% decrease from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 12.3% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 60.1% of the population in 2011. The median age is 54.4 years, which is greater than the provincial median age of 41.9 years. The population is weighted in favour of males (50.4% male) (Statistics Canada 2012).

In 2011, 6.1% of the population of the district identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

Regional District of Okanagan-Similkameen

The Regional District of Okanagan-Similkameen is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 3.2 km west of the Electoral Area H of the Regional District of Okanagan-Similakmeen (geodesic distance from RK 975.7). The Electoral Area H – Rural Princeton is located in the southwest corner of the Regional District. The Town of Princeton and the unincorporated rural communities of Coalmont and Tulameen are located in the boundaries of the Electoral Area, although the incorporated municipality of Princeton is not under the governance of Electoral Area H. The southern boundary of the Electoral Area is on the Canada–United States border. Electoral Area H is characterized by small settlements in a predominantly rural area. The main economic driver for the area is services in the Town of Princeton, as well as mining, renewable energy and tourism (Regional District of Okanagan-Similkameen 2011).

Census data for Electoral Area H of the Regional District of Okanagan-Similkameen includes data for rural areas and the hamlets of Coalmont and Tulameen. It does not include data for the Town of Princeton. In 2011, the Electoral Area H's population was approximately 1,768, which is a 16% decrease from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 7.6% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 71.3% of the population in 2011. The median age is 56 years, which is greater than the provincial median age of 41.9 years. The population is weighted in favour of males (51.1% male) (Statistics Canada 2012).

Aboriginal identity data is not available for Electoral Area H of the Regional District of Okanagan-Similkameen.

Town of Princeton

The Town of Princeton is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 38.7 km west from the Town of Princeton (geodesic distance from RK 992.3). Princeton is located approximately 86 km southeast of Merritt and 133 km east of Hope, driving distance, in the Regional District of Okanagan-Similkameen. The main economic drivers for the community are forestry, agriculture, mining, tourism and ranching (Town of Princeton 2013). Weyerhaeuser operates a soft wood lumber mill in Princeton which provides direct employment to approximately 250 individuals (Town of Princeton 2013).

In 2011, the Town of Princeton's population was approximately 2,724, which is a 2.0% decrease from 2006. The provincial population increased approximately 7.0% over the same period. Approximately

12.9% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 64.1% of the population in 2011. The median age is 52.5 years, which is greater than the provincial median age of 41.9 years. The population is weighted slightly in favour of females (50.4% female) (Statistics Canada 2012).

In 2011, 7.9% of the population of the town identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

6.5 Fraser Valley Region

6.5.1 Regional Overview

6.5.1.1 Population and Demographics

In 2011, the total population of the Fraser Valley Region was 274,400, an 8.1 % increase from 2006. Table A-2 in Appendix A summarizes select population characteristics for municipalities and Aboriginal communities in the region. As evidenced by the percent change in population from 2006 to 2011, the City of Chilliwack is growing most rapidly in the region. Conversely, the Village of Harrison Hot Springs is declining in population. Of the communities along the proposed pipeline corridor, the City of Chilliwack is growing the most rapidly, with a 12.6% increase in population from 2006 to 2011. In the Fraser Valley Region, 6.4% of the population identifies themselves as Aboriginal. Numerous IRs and communities are located in this region, with 7 IRs reserves crossed by the proposed pipeline corridor in the region.

In 2011, population mobility in the Fraser Valley Region varied depending on the community. Chawathil 4 IR had the highest percentage of internal migrants (31.3 % of the total population, based on movements between 2009 and 2011) and the Village of Harrison Hot Springs had the highest percent of external migrants (3.0 % of the total population during the same period). Of the municipal areas crossed by the Project, the District of Hope had the highest percent of internal migrants (6.2%); approximately 5.2% of the population had moved from within BC and approximately 1.0% had moved from another province or territory in Canada. Table A-4 in Appendix A summarizes select population mobility characteristics for municipalities and Aboriginal communities in the region.

Shadow populations are characterized by a large component of the temporary population living in project accommodations, hotels and motels and campgrounds but also living in permanent residences. The percentage of private dwellings occupied by usual (permanent) residents compared to the total number of private dwellings can be an indication of the presence of a shadow population. In the Fraser Valley Region in 2011, the average percentage of private dwellings occupied by permanent residents was 82.2%. Most communities and rural areas had from 65% to 95% of private dwellings occupied by permanent residents. The community or area with the lowest percentage was Fraser Valley Electoral Area B with 52.3%. The factor for this low percentage is undetermined. During technical discussions, it was noted that the City of Abbotsford receives approximately 3,500 to 4,000 seasonal workers annually for the farming industry (Koole pers. comm.). Based on this data the Fraser Valley Region has a relatively variable shadow population ranging from moderate, in the Village of Harrison Hot Springs (73.3%), to low in the City of Chilliwack (94.9%). A shadow population is known to fluctuate and the average percentage of private dwellings occupied by permanent residents does not account for the shadow population present in temporary accommodations. Section 8.4.5 provides information on housing (temporary and permanent accommodations) in the Fraser Valley Region.

Population projections for the Fraser Valley Regional District as a whole (extending beyond the area of the RSA) are 350,000 in 2023 and 390,000 in 2033 (BC Stats 2013). In general terms, the Lower Mainland area receives most of the international immigrants (90%) and interprovincial in-migrants (45%) in BC (BC Stats 2011a).

6.5.1.2 Income Levels and Distribution

In 2011, the median income for Fraser Valley Region was approximately $23,400. The median income ranged from $15,276 in Chehalis 5 to $28,398 in Electoral Area D, FVRD. Gender differentials in income

varied amongst communities in the Fraser Valley Region. In total, males in the Fraser Valley Region had a median income of $29,874, compared to $17,831 for females. In 2011, the median income of those working full-year, full-time and with employment income was approximately $45,700 for the Fraser Valley Region. It ranged from $30,839 in Chehalis 5 to $54,806 in Kwawkwawapilt 6 (Statistics Canada 2013a).

In 2011, Kwawkwawapilt 6 had the highest government transfer as a percent of income (43.5%) and the Electoral Area D, FVRD had the lowest (11.6%). Government transfer refers to all cash benefits received from the federal, provincial, territorial or municipal governments (*e.g.,* Old Age Security, Employment Insurance) (Statistics Canada 2013a). Table A-6 in Appendix A summarizes select income characteristics for municipalities and Aboriginal communities in the region.

6.5.1.3 Aboriginal Culture

Aboriginal people living both on-reserve and off-reserve reserve represent a unique demographic in the Fraser Valley Region. This region includes 88 IRs (not all populated), and 23 Aboriginal communities located in region have been identified as potentially affected by the Project (asserted traditional territories of potentially affected Aboriginal communities may be crossed by more than more than one socio-economic region). People of Aboriginal identity represent approximately 6.4% of the population in the Fraser Valley Region (Statistics Canada 2013a).

Key traditional land uses in the region include hunting, fishing, trapping, gathering (food and medicinal plants, plants used for traditional crafts) and the ceremonial use or maintenance of spiritual sites Salmon fishing is of particular cultural and economic importance to the people in the region, historically being an important food source and item used in trade and ceremonial practices. Fishing is carried out for both cultural and subsistence purposes. Aboriginal communities in the region also contribute to local industry, working as contractors and business owners in oil and gas, forestry and development. Communities have demonstrated a desire for training and work experience in these industries.

Given the level of urbanization and the history of development in the region, there is a relatively high degree of social and economic integration between Aboriginal and non-Aboriginal populations in the region. The low levels of use of Aboriginal language by those of Aboriginal identity reflect this integration. For example, in the Abbotsford Metropolitan Area in 2006 (City of Abbotsford and surrounding communities, IRs and rural areas), approximately 2.2% of the Aboriginal identity population indicated knowledge of an Aboriginal language, and approximately 0.9% of the Aboriginal identity population indicated that the language spoken most often at home was an Aboriginal language (Statistics Canada 2007). Use and knowledge of Aboriginal languages tends to be higher on-reserve.

Detailed overviews and a list of Aboriginal communities and IRs are found in Section 5.0 and in the Traditional Land and Resource Use Technical Report of Volume 5D.

6.5.1.4 Community Way of Life

The Fraser Valley Region includes various communities that represent urban and rural ways of life. Larger urban service centres such as the City of Abbotsford also have rural areas where agriculture plays an important role in the local economy. The region also has smaller service-based communities such as the District of Hope. Outdoor recreation opportunities such as hiking and camping are plentiful in the region. Section 7.5.5 further discusses outdoor recreational use in the Fraser Valley Region.

The City of Chilliwack Healthier Community Strategic Action Plan outlines priorities for the city to address, including homelessness and affordable housing, crime and public safety, and addictions and mental health (Main Street Communications Ltd. 2011). The plan aims to build on previous initiatives, including neighbourhood-specific initiatives, to address community well-being issues for the city as a whole.

The City of Abbotsford's social plan, Abbotsford Cares, identifies key priority areas and recommendations. Priority areas include affordable and accessible housing, children's issues, community networks, community safety and crime prevention, diversity and inclusion, general community well-being, health issues, seniors' issues and youth issues (City of Abbotsford 2006). The Abbotsford Social

Development Advisory Committee, a recommendation from Abbotsford Cares, provides guidance to City Council on social issues and is comprised of representatives from City Council, community organizations, public agencies, citizen representatives, priority specific representatives (*e.g.,* seniors) and City of Abbotsford staff (City of Abbotsford 2013).

For police service areas within the region, some categories of crime have shown a decline in incident rates between 2007 and 2012. The rate of violent crimes has declined approximately 20–30% for the rural police services based out of Hope, Barriere, Chilliwack and the municipal service in Abbotsford during this period (Table 6.5-1). The rate of property crime violation declined over 50% between 2007 and 2012 in the municipal police service areas of Hope and Abbotsford, and declined over 28% during the same period for rural police areas in Hope and Chilliwack. The rate of criminal code traffic violations also declined or stayed consistent for all police service areas between 2007 and 2012, with the exception of municipal areas of Hope where the rate increased by approximately 25%. Table 6.5-1 provides information on crime rates for key police service areas in the Fraser Valley Region calculated as incidents per 1,000 people.

TABLE 6.5-1

CRIME RATES, FRASER VALLEY REGION 2007 TO 2012

Police Service Area	Rate per 100,000 People														
	Total Violent Criminal Code Violations			Total Property Crime Violations			Total Other Criminal Code Violations (Except Traffic)			Total Criminal Code Traffic Violations			Total Drug Violations		
	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change
Hope, RCMP, municipal	24.7	24.4	-1.2%	145.6	62.5	-57.1%	51.3	35.7	-30.4%	6.0	7.5	25.0%	16.2	16.2	0.0%
Hope, RCMP, ural	156.7	122.1	-22.1%	99.9	71.2	-28.7%	23.3	21.1	-9.4%	12.4	12.4	0.0%	36.4	15.3	-58.0%
Barriere, RCMP, rural	17.7	12.7	-28.3%	47.0	27.1	-42.3%	12.4	10.6	-14.5%	10.8	9.6	-11.1%	17.7	16.0	-9.6%
Chilliwack, RCMP, rural	167.8	115.5	-31.2%	100.5	72.1	-28.4%	31.4	27.0	-14.0%	18.3	3.0	-83.6%	14.7	11.8	-19.7%
Abbotsford, municipal	13.9	9.8	-29.5%	72.6	35.2	-51.5%	8.6	6.9	-19.8%	4.3	3.2	-25.6%	3.3	3.3	0.0%

Source: Statistics Canada 2013d

Note: Some detachments report data for municipal and rural areas separately. Statistics Canada did not show data for some police service areas along the proposed pipeline corridor, including, Chilliwack (municipal) and Abbotsford (rural)

Key community events and assets that have been identified in the region that could interact with the Project include the following.

- The proposed pipeline corridor crosses Mountain View Cemetery (approximately RK 1042.3) in the District of Hope.
- Cheam Lake Wetlands Regional Park is crossed by the proposed pipeline corridor (RK 1080.1 to RK 1080.4).
- The proposed pipeline corridor crosses an elementary school and a middle school in the City of Chilliwack (RK 1098.1 to RK 1098.3 and RK 1097.5 to RK 1097.8, respectively).
- The Ledgeview Golf and Country Club in the City of Abbotsford is crossed by the Project (approximately RK 1118.8 to RK 1119.8).
- Popular community trails, including the Hope Lookout trail, in the District of Hope are crossed (approximately RK 1045.0).
- Othello Road in the District of Hope is a key road for residents, tourists and local business (Misumi pers. comm.). Othello Road is crossed by the proposed pipeline corridor at approximately RK 1035.2.
- Camping areas located near the proposed crossing location along the Coquihalla River.
- The City of Abbotsford hosts the Abbotsford Airshow annually in August, which attracts large crowds and typically fills all available hotels in Abbotsford, Chilliwack, Langley and Surrey (Teichroeb pers. comm.).
- Agricultural production is key to the region's identity and economy.

Key socio-cultural interests and issues in the region that have been identified by stakeholders related to the Project include the following.

- Opportunities for local businesses, workers, and contractors.
- Economic spin-offs related to temporary Project workforce residing in regional communities.
- Opportunities for improved access and condition in areas of the Trans Canada Trail.
- Potential for crowding in housing, service pressures, and social issues related to temporary workers.
- Construction related noise and traffic congestion.
- Protection of land, vegetation, watercourses, and wildlife used for traditional Aboriginal livelihood and cultural purposes.

6.5.2 Communities and Regions in the Project Footprint

This subsection presents information on communities and regions in the Project Footprint of the Fraser Valley Region. Selected population, mobility and income statistics are located in Tables A-2, A-4 and A-6 in Appendix A.

Fraser Valley Regional District

The proposed pipeline corridor is located in the FVRD for approximately 146.2 km, from RK 991.2 to RK 1137.4. There a several pump stations located in the FVRD: the Waleach Pump Station (RK 1078.1) and the Sumas Pump Station (RK 1113.8). The Sumas Tank Farm (RK 1117.1) is also located in the FVRD.

The proposed pipeline corridor in the FVRD is located within the boundaries of the FVRD OCP for Popkum-Bridal Falls. This plan serves as a statement of the broad objectives and policies of the Regional board regarding the form and character of existing and future land use and servicing in the plan area. The plan has a number of purposes related to growth and development; land use and the provision of public services, protection of the environment, and implementing zoning and other bylaws. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (FVRD 1997).

The Socio-Economic RSA is located within the boundaries of the FVRD OCP for Portions of Electoral Area "B" Yale, Emory Creek, Dogwood Valley and Choate (Bylaw No.150, 1998) and the FVRD OCP for Electoral Area "E" (Bylaw No. 1115, 2011). The proposed pipeline corridor does not cross the area covered by these plans. The FVRD OCP for portions of Electoral Area D outlines objectives and policies of the Regional District Board. Specific concerns were identified through public meetings, open houses and advisory planning commission meetings and include economic stability, land use, road improvements, railway operations, heritage conservation, tourism development and commercial area improvements. The FVRD OCP for Electoral Area E provides objectives and policies relating to: the development of residential areas to meet anticipated housing needs; proposed commercial, industrial, institutional, agricultural, recreational and public utility land uses; restrictions on use of land that are subject to hazardous conditions or sensitive areas; development of major roads, sewer and water infrastructure, as well as public facilities.

The FVRD consists of the cities of Abbotsford and Chilliwack, the districts of Hope, Kent and Mission, the Village of Harrison Hot Springs and Electoral Areas A, B, C, D, E, F and G. The proposed pipeline corridor traverses the District of Hope, City of Chilliwack, City of Abbotsford and Electoral Areas B, D and E within the FVRD. Electoral Area G is located in the Socio-Economic RSA. The FVRD provides regional planning as well as other services in collaboration with each municipality, such as regional parks, air quality, and dispatch fire service; it also provides local government services to unincorporated communities and rural areas located in the electoral areas (FVRD 2008). Unincorporated communities located in Electoral Areas B, D and E are listed in Table 6.5-2. Within the FVRD no unincorporated communities are crossed by the proposed pipeline corridor. FVRD headquarter offices are based in Chilliwack.

TABLE 6.5-2

UNINCORPORATED COMMUNITIES LOCATED IN THE FRASER VALLEY REGIONAL DISTRICT ELECTORAL AREAS IN THE SOCIO-ECONOMIC REGIONAL STUDY AREA

Electoral Area	Unincorporated community
B	• Dogwood Valley • Choate • Emory Creek • Laidlaw • Othello • Sunshine Valley • Yale • Spuzzum
D	• Popkum • Bridal Falls

TABLE 6.5-2 Cont'd

Electoral Area	Unincorporated community
E	• Baker Trails • Bell Acres • Cultus Lake • Lindell Beach • Slesse Park

Source: FVRD 2008

Notes: Unincorporated communities are not necessarily crossed by the proposed pipeline corridor.

Census data for Electoral Areas B, D, E and G of the FVRD includes data for rural areas and the unincorporated communities listed in Table 6.5-1. It does not include data for municipalities. In 2011, Electoral Areas B, D, E and G of the FVRD had a total population of 7,487, which is a 4.0% decrease since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 14.7% of the population is between the ages of 0 and 14 years of age compared to 15.4% for BC. The median age is 47.0 years, 5.1 years older than the provincial median age of 41.9 years. The workforce population (population between 15 and 64 years) is 73.9% of the total population. The gender ratio of the population is weighted slightly in favour of males (51.5% male) (Statistics Canada 2012).

In 2011, 4.4% of the population of the electoral area identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

District of Hope

The proposed pipeline corridor crosses the District of Hope for 17.4 km (RK 1038.2 to RK 1055.6). Hope is located in the FVRD and is located approximately 150 km east of Vancouver on Highway 1 (Trans Canada Highway). Hope has been identified by Trans Mountain as a potential construction hub community.

Tourism is a main economic driver in Hope, having diversified from historical economic activities of forestry, transportation and mining. Commercial manufacturing and retail services are also important economic contributors. The largest private employers in Hope are Nestlé Waters, Cooper's Foods and Emil Anderson Maintenance (Advantage Hope 2011, Hope BC 2012).

The proposed pipeline corridor in the District of Hope is located within the boundaries of the District of Hope OCP. This plan is a municipal bylaw that sets the broad framework for managing development in the District of Hope by providing objectives for different land uses anticipated to meet future needs for a 5 to 10 year period. Additionally, the plan sets objectives for community services and facilities. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (District of Hope 2004).

In 2011, the District of Hope had a population of approximately 5,970, which is a 3.5% decrease since 2006. The District of Hope noted this was not indicative and in fact the population has been stable (Fortoloczky, Susan Johnston pers. comm.). The provincial population increased approximately 7.0% over the same period. Approximately 13.7% of the population is 0 to 14 years of age compared to 15.4% for BC. The population has a median age of 50.2 years, which is 8.3 years older than the provincial median of 41.9 years. The workforce population (population between 15 and 64 years) is 68.4% of the total population. The gender ratio of the population is weighted slightly in favour of females (50.2% females) (Statistics Canada 2012).

In 2011, 8.0% of the population of the district identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- Groundwater is a primary key concern (Fortoloczky, Susan Johnston, Misumi pers. comm.).
- Concern regarding the use of Othello Road which requires upgrading (Fortoloczky, Misumi pers. comm.). Othello Road is used by residents, tourists and local businesses for access, including access to the Othello Tunnels at the Coquihalla Canyon Provincial Park.
- Concern regarding waterway crossings (Fortoloczky pers. comm.).
- Concerns with the potential for noise and odours (Fortoloczky pers. comm.).
- A wildlife species of concern is the spotted frog (Fortoloczky pers. comm.).
- Archaeology sites of importance were noted around Kawkawa Lake (Fortoloczky, Vaughan pers. comm.).
- Minimizing disruption to tourism was identified as a concern at the Hope Community Workshop;
- The importance consultation and collaboration with communities and Aboriginal communities.
- Drugs and alcohol were noted as issues in the community, youth drug use in particular (McBride pers. comm.).
- At the Hope Community Workshop, temporary worker integration into the community was identified as a general preference.

City of Chilliwack

The proposed pipeline corridor crosses the City of Chilliwack for approximately 25.7 km (RK 1082.3 to RK 1108). Chilliwack is located approximately 100 km east of the City of Vancouver along Highway 1. Chilliwack is the second most populated area in the FVRD and has been identified as a potential construction hub by Trans Mountain. Over 60% of Chilliwack's land base is dedicated to agriculture and the main economic drivers for the community are: agriculture; education; food processing; healthcare; aviation and aerospace; film; manufacturing; professional services; real estate; tourism; retail and wholesale trade; and technology (Chilliwack Economic Partners Corporation 2011).

The proposed pipeline corridor in the City of Chilliwack is located within the boundaries of the City of Chilliwack OCP. The purpose of this plan is to provide direction for future development, environmental protection, parks, transportation, recreation and service infrastructure. In addition, the plan will act as a policy guide to Council for short and long-term land use and development decisions, including associated social, economic, environmental and physical development. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (City of Chilliwack 1998).

In 2011, the City of Chilliwack's population was approximately 77,935, which is a 12.6% increase since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 19.4% of the population is 0 to 14 years of age compared to 15.4% for BC. The population has a median age of 39.8 years, which is 2.1 years younger than the provincial median of 41.9 years. The workforce population (population between 15 and 64 years) is 71.6% of the total population. The gender ratio of the population is weighted slightly in favour of females (51.2% females) (Statistics Canada 2012).

In 2011, 7.8% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- Groundwater concerns and the Vedder River Fan Aquifer (also identified as the Sardis aquifer locally) (Blain pers. comm.).
- From a community perspective, it is better to use the existing right-of-way to limit further development restrictions (Sanderson pers. comm.).
- The potential for the pipeline to create restrictions to municipal activities, infrastructure and services (Sanderson pers. comm.).
- The importance of sharing final routing information (Blain pers. comm.).

City of Abbotsford

The proposed pipeline corridor crosses the City of Abbotsford for approximately 29.4 km (RK 1108 to RK 1137.4). The Sumas Pump Station (RK 1114.2) and Sumas Terminal (RK 1117.5) are located in the City of Abbotsford. Abbotsford is located approximately 72 km east of the City of Vancouver along Highway 1, and is the largest municipality in the FVRD. Abbotsford is located in one of Canada's most productive agricultural areas (City of Abbotsford 2009a). Abbotsford's landscape also allows for abundant outdoor activities such as hiking, mountain biking, and fishing (City of Abbotsford 2009a). The main economic drivers include agriculture, agri-business and food processing, regional retail and services, distribution and trade, tourism and accommodation opportunities and manufacturing, including for export (City of Abbotsford 2009a).

The proposed pipeline corridor in the City of Abbotsford is located within the boundaries of the City of Abbotsford OCP. This plan is built on five major planning strategies intended to realize the vision of the city, including: creating a complete community; protecting our natural environment; building a healthy, inclusive community; making better connections; and strengthening the city centre. This plan does not specify restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (City of Abbotsford 2005).

In 2011, the City of Abbotsford's population was approximately 133,500, which is a 7.4% increase since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 19.0% of the population is 0 to 14 years of age compared to 15.4% for BC. The population has a median age of 37.9 years, which is 4 years younger than the provincial median of 41.9 years. The workforce population (population between 15 and 64 years) is 73.4% of the total population. The gender ratio of the population is weighted slightly in favour of females (50.7% females) (Statistics Canada 2012).

In 2011, 3.4% of the population identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- Increased sensitivity to pipelines and potential environmental issues as a result of two oil spills on Sumas Mountain (Teichroep pers. comm.).
- Concern over odour in residential neighbourhoods near the Sumas Tank Farm (Teichroeb pers. comm.).
- Concern about construction demands on local services was identified at the Abbotsford Community Workshop.
- There has been a fair amount of development around the existing TMEP right-of-way (Teichroeb pers. comm.).

6.5.3 Communities and Regions in the Socio-Economic Regional Study Area

This subsection presents information on communities and regions in the Socio-Economic RSA of the Fraser Valley Region. Selected population, mobility and income statistics are located in Table A-2, A-4 and A-6 in Appendix A.

District of Kent

The District of Kent is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 0.5 km southeast from the District of Kent (geodesic distance from RK 1060.8). Kent is located approximately 122 km east of the City of Vancouver in the FVRD. The community of Agassiz is located in the District of Kent. The district's primary industries include agriculture, forestry, mining and fishing. The federal government is a major employer with two Correctional Service of Canada facilities, Kent and Mountain Institutes, and the Pacific Agri-Food Research Centre (District of Kent Agassiz 2001).

In 2011, the District of Kent's population was approximately 5,664, which is an 8.8% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 14.9% of the population is between 0 and 14 years of age similar to 15.4% for BC. The workforce population (population between 15 and 64 years) was 70.2% of the population in 2011. The median age is 45.3 years, which is greater than the provincial median age of 41.9 years. The population is weighted in favour of males (55.7% male) (Statistics Canada 2012).

In 2011, 7.7% of the population of the district identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

Village of Harrison Hot Springs

The Village of Harrison Hot Springs is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 6.7 km southeast from the Village of Harrison Hot Springs (geodesic distance from RK 1067.9). The village is located approximately 131 km east of Vancouver in the FVRD. The labour base for the village is in services, retail trade, manufacturing, government, construction and transportation (The Village of Harrison Hot Springs 2010).

In 2011, the Village of Harrison Hot Springs' population was approximately 1,468, which is a 6.7% decrease from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 11.6% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 64.0% of the population in 2011. The median age is 54.0, which is greater than the provincial median age of 41.9. The population is weighted in favour of females (50.7% female) (Statistics Canada 2012).

In 2011, 3.7% of the population of the village identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

District of Mission

The District of Mission is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 1.1 km south from the District of Mission (geodesic distance from RK 1128.6). Mission is located approximately 70 km east of Vancouver in the FVRD. It is located on the north side of the Fraser River. Historically, the main economic sectors of Mission included agriculture and forestry. Emerging industries include manufacturing, commercial, film, tourism and transportation (District of Mission 2013).

In 2011, the District of Mission's population was approximately 36,426, which is a 5.6% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 19% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 76.4% of the population in 2011. The median age

is 39.3 years, which is less than the provincial median age of 41.9 years. The population is weighted in favour of males (50.3% male) (Statistics Canada 2012).

In 2011, 6.4% of the population of the district identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

6.6 Metro Vancouver Region

6.6.1 Regional Overview

6.6.1.1 Population and Demographics

In 2011, the total population of Metro Vancouver Region was over 2.3 million, a 9.3% increase from 2006. Table A-2 in Appendix A summarizes select population characteristics for municipalities and Aboriginal communities in the region. As evidenced by the percent change in population from 2006 to 2011, the City of Port Moody is growing most rapidly in the study area. Conversely, the Village of Belcarra is declining in population. Of the communities along the proposed pipeline corridor, the City of Surrey is growing the most rapidly, with a 18.6% increase in population from 2006 to 2011. In the Metro Vancouver Region, 2.4 % of the population identifies themselves as Aboriginal. There are several IRs and communities in this region; however, no reserves are crossed by the proposed pipeline corridor.

In terms of population mobility, in 2011 approximately 4.6% of the regional population were internal migrants or had moved into the region during the previous two years; approximately 3.8% had moved from within BC and approximately 0.8% had moved from another province or territory within Canada. IRs and the rural area tended to show higher proportions of internal migration than municipal areas (6.0% for rural areas and 6.2% for IRs). Table A-4 in Appendix A summarizes select population mobility characteristics for municipalities and Aboriginal communities in the region.

Shadow populations are characterized by a large component of the temporary population living in project accommodations, hotels and motels and campgrounds but also living in permanent residences. The percentage of private dwellings occupied by usual (permanent) residents compared to the total number of private dwellings can be an indication of the presence of a shadow population. In the Metro Vancouver Region in 2011, the average percentage of private dwellings occupied by permanent residents was 93.1%. The community or area with the lowest percentage was Bowen Island with 76.4%, likely due to recreational attractions. Based on this data the Metro Vancouver Region has a relatively variable shadow population ranging from moderate, in Bowen Island, to low in the City of Port Moody (97.2%). A shadow population is known to fluctuate and the average percentage of private dwellings occupied by permanent residents does not account for the shadow population present in temporary accommodations. Section 8.4.6 provides information on housing (temporary and permanent accommodations) in the Metro Vancouver Region.

Population projections for the GVRD are over 2.8 million in 2023 and over 3.1 million in 2033 (BC Stats 2013). In general terms, the Lower Mainland area receives most of the international immigrants (90%) and interprovincial in-migrants (45%) in BC (BC Stats 2011a). The Metro Vancouver Liveable Region Strategic Plan will likely influence the distribution of population growth in the region. A growth concentration area includes the communities of Burnaby, Coquitlam, North Surrey, Port Coquitlam, Port Moody, New Westminster, North Delta and Vancouver. The entire region is expected to continue to experience strong growth (BC Stats 2011a).

6.6.1.2 Income Levels and Distribution

In 2011, the median income for Metro Vancouver Region was approximately $32,400. The median income ranged from $12,644 in the Mission 1 to $58,693 in the Village of Belcarra. Gender differentials in income varied amongst communities in the Metro Vancouver Region. In total males in the Metro Vancouver Region had a median income of $39,780, compared to $25,922 for females. In 2011, the median income of those working full-year, full-time and with employment income was approximately

$53,100 for the Metro Vancouver Region. It ranged from $24,731 in Matsqui 4 to $73,938 in West Vancouver (Statistics Canada 2013a).

In 2011, Matsqui 4 had the highest government transfer as a percent of income (56.3%) and the Village of Anmore had the lowest (3.6%). Government transfer refers to all cash benefits received from the federal, provincial, territorial or municipal governments (*e.g.,* Old Age Security, Employment Insurance) (Statistics Canada 2013a). Table A-6 in Appendix A summarizes select income characteristics for municipalities and Aboriginal communities in the region.

6.6.1.3 Aboriginal Culture

Aboriginal people living both on and off reserve represent a unique demographic in the Metro Vancouver Region. The Region includes 21 IRs, and 9 Aboriginal communities located in region have been identified as potentially affected by the Project (asserted traditional territories of potentially affected Aboriginal communities may be crossed by more than more than one socio-economic region). People of Aboriginal identity represent approximately 2.4% of the population in the region (Statistics Canada 2013a).

Key traditional land uses in the region include hunting, fishing, trapping, gathering (food and medicinal plants, plants used for traditional crafts) and the ceremonial use or maintenance of holy sites. Aboriginal communities collect berries, salmon, seafood and other fish and collaborate with one another during the salmon harvest. Fishing is of particular cultural and economic importance to the people in the Metro Vancouver Region, historically being an important food source as well as used in trade and ceremonial practices. Even today, fishing is carried out for both cultural and subsistence purposes. The Aboriginal communities in the region also contribute to local industry, working as contractors and business owners. The Metro Vancouver Region is unique in that it is a densely developed metropolitan region, and Aboriginal communities tend to be involved in residential and industrial development as well as other urban businesses and urban economic development. Where data is available, Aboriginal communities show high rates of unemployment and relatively low labour force participation rates.

Given the high level of urbanization and the history of development in the region, there is a relatively high degree of social and economic integration between Aboriginal and non-Aboriginal populations in the region. The low levels of use of Aboriginal language by those of Aboriginal identity reflect this integration. For example, in the GVRD in 2006, approximately 3.2% of the Aboriginal identity population indicated knowledge of an Aboriginal language, and approximately 0.3% of the Aboriginal identity population indicated that the language spoken most often at home was an Aboriginal language (Statistics Canada 2007). Use and knowledge of Aboriginal languages tends to be higher on-reserve.

Detailed overviews and a list of Aboriginal communities and reserves are found in Section 5.0 and in the Traditional Land Use Technical Report of Volume 5D.

6.6.1.4 Community Way of Life

The Metro Vancouver Region is the most populous area in BC and includes multiple large urban service centres, as well as the Village of Belcarra and Bowen Island. Municipalities that are crossed by the Project include the Township of Langley, the City of Surrey, the City of Coquitlam and the City of Burnaby. Outdoor recreation opportunities and activities such as boating, cycling and hiking are plentiful in the region, in both urban areas and unincorporated areas. Section 7.5.6 further discusses outdoor recreational use in the Metro Vancouver Region.

The Metro Vancouver Region is experienced with large construction projects, with many occurring at any time given the strong pattern of urban growth and development in many member municipalities. Recent linear projects in municipalities crossed by the proposed pipeline corridor include the rapid transit Canada Line, the rapid transit Evergreen Line (currently under construction), the Port Mann Bridge and multiple highway upgrades. The Township of Langley's Sustainability Charter seeks to balance social/cultural, economic and environmental present and future needs of the community. The social/cultural goals outlined in the charter include: celebrate our heritage; protect our people and properties; build corporate

and community capacity; provide and support community-based leisure opportunities; and nurture a mindset of sustainability (Township of Langley 2008).

The City of Surrey's Plan for the Social Well-Being of Surrey Residents identifies priority areas and directs development. Priority issues include children and youth, housing and homelessness, and community development and inclusion (The Social Planning and Research Council of BC 2006). Additional issues identified by the Social Plan, including crime, public safety, substance abuse and addictions, are the focus of the Crime Reduction Strategy (City of Surrey 2007, 2013). The City of Surrey also has a Cultural Plan, the goals of which are to enhance arts, heritage and urbanization in the following areas: the city centre; town centres; the sense of community; community involvement potential; and the economy and city efforts (City of Surrey 2011a).

The City of Coquitlam focuses social planning on improving well-being and quality of life in the community. Social planning strategies include housing affordability and the Multiculturalism Strategic Plan (City of Coquitlam 2013).

The Burnaby Social Sustainability Strategy outlines various goals, priorities and actions to improve the quality of life of Burnaby citizens and provides a framework for city decisions for approximately 10 years. The strategic priorities build upon past work and include: meeting basic needs; celebrating diversity and culture; getting involved; learning for life; enhancing neighbourhoods; getting around; and protecting the community (City of Burnaby 2011). From the Burnaby Social Sustainability Strategy, an implementation plan was developed, outlining approved actions to focus on for approximately five years (City of Burnaby 2013).

For police service areas along the proposed pipeline corridor within the region, some categories of crime violations have shown a decline in incident rates between 2007 and 2012. The rate of violent crimes has declined for police service areas in Langley, Surrey, Coquitlam and Burnaby (ranging from a decline of approximately -2% for rural police services in Coquitlam to a decline of approximately -42% for municipal areas in Burnaby). The rate of property crimes also decreased for all police services noted during the same region. The rate of drug violations has been more variable. Between 2007 and 2012, rural police services in Coquitlam indicated over an 190% increase in the rate of drug violations, while municipal police service in Coquitlam reported an approximately 13% decline. Municipal police services in Langley and Surrey reported notable decreases in drug violation rates during this period (-41% and -32% respectively). Table 6.6-1 provides information on crime rates for key police service areas in the Metro Vancouver Region, based on incidents per 1,000 people.

TABLE 6.6-1

CRIME RATES, METRO VANCOUVER REGION 2007 TO 2012

	Rate per 1,000 People														
	Total Violent Criminal Code Violations			Total Property Crime Violations			Total Other Criminal Code Violations (Except Traffic)			Total Criminal Code Traffic Violations			Total Drug Violations		
Police Service Area	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change	2007	2012	% Change
Langley Township RCMP, municipal	11.7	9.3	-20.5%	72.3	53.8	-25.6%	13.1	12.0	-8.4%	4.4	3.7	-15.9%	7.3	4.3	-41.1%
Surrey, RCMP municipal	20.3	15.7	-22.7%	73.1	61.5	-15.9%	17.9	17.2	-3.9%	4.1	4.0	-2.4%	6.5	4.4	-32.3%
Coquitlam, RCMP municipal	10.0	7.6	-24.0%	52.7	36.0	-31.7%	14.7	13.0	-11.6%	2.5	2.5	0.0%	4.5	3.9	-13.3%
Coquitlam RCMP rural	35.7	34.8	-2.5%	25.5	18.7	-26.7%	6.3	8.6	36.5%	2.0	3.4	70.0%	2.7	7.9	192.6%
Burnaby, RCMP municipal	14.2	8.2	-42.3%	67.8	49.9	-26.4%	9.5	5.3	-44.2%	2.1	2.4	14.3%	3.7	3.9	5.4%

Source: Statistics Canada 2013d

Note: Some detachments report data for municipal and rural areas separately. Statistics Canada did not show data for some police service areas along the proposed pipeline corridor, including Surrey (rural).

Key community events and assets that have been identified in the region that could interact with the Project include the following.

- The proposed pipeline corridor crosses municipal and regional parks including the Hope Redwoods Natural Area in the Township of Langley (approximately RK 1151.2 to RK 1151.5), the Surrey Bend Regional Park in Surrey (approximately RK 1160.5 to RK 1164) and the Burnaby Mountain Conservation Area in Burnaby (approximately RK 1180.3 to RK 1181).
- The proposed pipeline corridor crosses the Eaglequest Coquitlam golf course (approximately RK 1172.2 to RK 1173).
- The Blues and Roots Festival takes place yearly in early August in the City of Burnaby.

Key socio-cultural interests and issues in the region that have been identified by stakeholders related to the Project include the following.

- Opportunities for local businesses, workers, and contractors.
- Construction related noise and traffic congestion.
- Disruption to residential and community use areas.
- Visual impacts of night lighting during construction and the expanded dock at the Westridge Marine Terminal.
- Protection of land, watercourses, vegetation and wildlife used for traditional Aboriginal livelihood and cultural purposes.

6.6.2 Communities and Regions in the Project Footprint

This subsection presents information on communities and regions in the Project Footprint of the Metro Vancouver Region. Selected population, mobility and income statistics are located in Tables A-2, A-4 and A-6 in Appendix A.

Metro Vancouver

The proposed pipeline corridor is located in the GVRD (Metro Vancouver) for 46.8 km. This distance is the portion of the proposed pipeline corridor that crosses the Township of Langley and cities of Surrey, Coquitlam and Burnaby. No other member municipalities are traversed by the corridor. The Burnaby Terminal (RK 1180.2) and Westridge Marine Terminal (RK 3.6) are located in Metro Vancouver.

Metro Vancouver operates as a regional district and greater board to deliver regional services to 22 municipalities, 1 Electoral Area and 1 Aboriginal community (Tsawwassen First Nation) (Metro Vancouver 2011a). The municipalities include: the City of Abbotsford (for park purposes only), the Village of Anmore, the Village of Belcarra, Bowen Island, the City of Burnaby, the City of Coquitlam, the Corporation of Delta, the City of Langley, the Township of Langley, the Village of Lions Bay, the District of Maple Ridge, the City of New Westminster, the City of North Vancouver, the District of North Vancouver, the City of Pitt Meadows, the City of Port Coquitlam, the City of Port Moody, the City of Richmond, the City of Surrey, the City of Vancouver, the District of West Vancouver and the City of White Rock. Electoral A of Metro Vancouver consists of Barnston Island, the University of BC (UBC), University Endowment Lands (UEL) and northern area of the regional district. The majority of Electoral Area A's population is located at UBC and UEL.

Metro Vancouver consists of four separate corporate entities: GVRD; Greater Vancouver Sewerage and Drainage District; Greater Vancouver Water District; and the Metro Vancouver Housing Corporation (Metro Vancouver 2011a). Sustainability was made the main principle for Metro Vancouver plans and operations beginning in 2002 (Metro Vancouver 2011a). Metro Vancouver is responsible for management

plans in relation to drinking water, solid and liquid waste, air quality, regional parks and regional growth (Metro Vancouver 2011a). Metro Vancouver's head offices are located in the City of Burnaby.

Metro Vancouver's Regional Growth Strategy (RGS), *Metro Vancouver 2040 – Shaping our Future*, focuses on land use policies to guide the future development of the region and support the efficient provision of transportation, regional infrastructure and community services. In combination with other management plans, Metro Vancouver's RGS can help meet the region's priorities and mandates and support the long-term commitment to sustainability.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, issues pertaining to air quality, odour, noise, regional parks and water quality were raised by Metro Vancouver. Specifically, the following issues were identified.

- Potential noise and odour effects due to the backup generators of pump stations in Metro Vancouver and other urban areas (Preston pers. comm.).
- Whether construction of the pipeline in Sumas Mountain Regional Park will be outside of the existing right-of-way and could affect trail networks to nearby natural features (Sheffield pers. comm.).

Census data for Electoral Area A of Metro Vancouver includes data for rural areas, UBC and UEL. It does not include data for municipalities. In 2011, Electoral Area A of Metro Vancouver had a population of approximately 11,050, which is an 18.0% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 16.8% of the population is 0 to 14 years of age compared to 15.4% for BC. The population has a median age of 32.6 years, which is 9.3 years younger than the provincial median age of 41.9 years. The workforce population (population between 15 and 64 years) is 82.9% of the total population. The gender ratio of the population is weighted slightly in favour of females (51.9% females) (Statistics Canada 2012).

In 2011, 7.3% of the population of the electoral area identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

Township of Langley

The proposed pipeline corridor crosses the District Municipality of the Township of Langley (Township of Langley) for 18.7 km (RK 1137.4 to RK 1156.1). The Township of Langley is located approximately 46 km east of Vancouver along Highway 1, and is located in Metro Vancouver.

The proposed pipeline corridor in the Township of Langley is located within the boundaries of the Township of Langley OCP. The goals of this plan are to: attractively service urban areas providing diverse opportunities, suitable to the varied lifestyles in the municipality; maintain the rural character outside designated urban growth areas; preserve good quality air, water and land environments; rational development of agricultural, industrial and commercial enterprises to provide a balance between residential and other uses; provide adequate physical and social services within the means of the municipality; and to preserve and enhance the unique and character-defining aspects of Langley's historic sites, communities and cultural resources. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (Township of Langley 1979).

The township has a diverse economy ranging from farming and agriculture to commercial, retail, and service, to heavy industrial and manufacturing (Township of Langley 2011a). The Township of Langley noted that residents along the existing Trans Mountain pipeline ranged from dairy farmers to urban dwellers (Seifi pers. comm.). Major employers include, but are not limited to, Inland Kenworth Group, BC Hydro, GE Canada, and Canada Bread Company Ltd. (Township of Langley 2011a).

In 2011, the District Municipality of Langley's population was 104,180, which is an 11.2% increase since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 18.6% of the population is 0 to 14 years of age compared to 15.4% for BC. The population has a median

age of 40.3 years, which is 1.6 years younger than the provincial median of 41.9 years. The workforce population (population between 15 and 64 years) is 75.6% of the total population. The gender ratio of the population is weighted slightly in favour of females (51% females) (Statistics Canada 2012).

In 2011, 3.4% of the population of the township identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified:

- the township expressed concern that pile driving would be extremely noisy for nearby residents during construction (Seifi pers. comm.); and
- overall, a pipeline spill is the biggest concern (Seifi pers. comm.).

City of Surrey

The proposed pipeline corridor crosses the City of Surrey for 12.8 km (RK 1156.1 to RK 1168.9). Surrey is located approximately 30 km southeast of Vancouver and is the second most populous municipality in Metro Vancouver.

The proposed pipeline corridor in the City of Surrey is located within the boundaries of the City of Surrey OCP. This plan was adopted by the City of Surrey City Council to guide land use and development over the next 5 to 20 years. It is Council's intention to achieve orderly growth for complete sustainable communities with sensitivity to the environment. This growth includes residential growth as well as a growing business base for Surrey. This plan does not specify restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (City of Surrey 2012).

Key economic drivers are agriculture, clean energy, finance, real estate, high technology, advanced manufacturing, education, health and arts (City of Surrey 2012).

It was noted there has been a lot of recent highway work/new infrastructure in the Surrey area. Numerous environmental, biodiversity and socio-economic studies were completed for the following projects: Port Mann Bridge (includes Surrey, Langley, Coquitlam and Burnaby); Golden Ears Bridge; and South Fraser Perimeter Road Project (Baron pers. comm.).

In 2011, Surrey's population was 468,255, which is an 18.6% increase since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 19% of the population is 0 to 14 years of age compared to 15.4% for BC. The population has relatively young median age of 37.5 years, 4.4 years younger than the provincial median of 41.9 years. The workforce population (population between 15 and 64 years) is 76.0% of the total population. The gender ratio of the population is weighted slightly in favour of females (50.5% females) (Statistics Canada 2012).

In 2011, 2.4% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- Surrey Council is against an increase in tanker traffic (Baron pers. comm.).
- Issues including noise (*e.g.,* pile driving, blasting, reverse beepers) and inconveniences during construction were noted (Baron pers. comm.).
- Numerous other projects are proposed or under construction along the proposed pipeline corridor in Surrey, particularly near the Surrey Bend Park (Baron pers. comm.). The other projects are ahead of the TMEP in terms of timing.

- From a community and socio-economic perspective, the proposed pipeline corridor is preferable; however, it is worse than the existing TMPL right-of-way from an environmental perspective (Luymes, Baron pers. comm.).

City of Coquitlam

The proposed pipeline corridor crosses the City of Coquitlam for 6.2 km (RK 1168.9 to RK 1175.1). Coquitlam is located approximately 22 km east of Vancouver, in Metro Vancouver.

The proposed pipeline corridor in the City of Coquitlam is located within the boundaries of the City of Coquitlam Citywide OCP. The purpose of this plan is to guide future land use and servicing provisions in ways that sustain its citizens' values. The plan provides a broader framework for considering and managing future change, including policies to implement the framework and address related needs for amenities, services and infrastructure support. This plan does not specify any restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project (City of Coquitlam 2001).

The main economic drivers are professional services, retail and wholesale trade, manufacturing, technology and construction. Coquitlam also has a mix of outdoor activities and attractions such as outdoor adventures, sporting activities, art and cultural experiences (City of Coquitlam 2013).

In 2011, City of Coquitlam's population was 126,455, which is a 10.4% increase since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 16.4% of the population is 0 to 14 years of age compared to 15.4% for BC. The population has a median age of 40.3 years, 1.6 years younger than the provincial median of 41.9 years. The workforce population (population between 15 and 64 years) is 79.0% of the total population. The gender ratio of the population is weighted slightly in favour of females (50.9% females) (Statistics Canada 2012).

In 2011, 10.5% of the population of city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, communication with residents and land users during construction to respond to concerns regarding odours and noise was raised at the Coquitlam Community Workshop.

Based upon consultation with the city, future planning and maintenance of municipal infrastructure were identified as areas of interest and concern.

City of Burnaby

The proposed pipeline corridor crosses the City of Burnaby for 8.9 km (RK 1175.1 to RK 1183.4). The Burnaby Terminal (RK 1180.2) and Westridge Marine Terminal (RK 3.6) are located in the City of Burnaby. The city shares its western boundary with the City of Vancouver and is located in Metro Vancouver.

The proposed pipeline corridor in the City of Burnaby is located within the boundaries of the Burnaby OCP. The purpose of this plan is to provide direction for the growth management role that the city should play over the next 10 years and beyond. The goal of the plan is to create a more complete and livable community that reflects local needs, aspirations and values, and at the same time defines Burnaby's contribution to helping shape a livable region for the next decade and beyond. This plan specifies restrictions or considerations pertaining to pipeline construction within the land use zones crossed by the Project. The OCP outlines the following goals for the petro-chemical industrial sector: improve the quality of air emissions and water run-offs; ensure that contemporary safety and emergency response standards are met; ensure that improvements are made to increase "neighbourliness" with surrounding uses, particularly residential; be partners with the City and the community in undertaking environmental stewardship initiatives involving key environmental features (*e.g.,* creeks, ravines and foreshore areas) within their lands; strive for public access provisions, either for trail continuity or focal point purposes,

involving these lands without compromising safety or operational considerations; and reduce operational noise and spills (City of Burnaby 1998).

The City of Burnaby's economic drivers include light industry, heavy industry, agriculture, warehousing/distribution, information technology, film, new media, environmental technology services, tourism and professional services (City of Burnaby 2013). Burnaby also features high technology research and business parks (City of Burnaby 2013). A quarter of city lands are designated as parks and open spaces (City of Burnaby 2013).

In 2011, City of Burnaby's population was 223,220, which is a 10.1% increase since 2006. The provincial population increased approximately 7.0% over the same period. Approximately 13.9% of the population is 0 to 14 years of age compared to 15.4% for BC. The population has a median age of 39.8 years, 2.1 years younger than the provincial median of 41.9 years. The workforce population (population between 15 and 64 years) is 78.1% of the total population. The gender ratio of the population is weighted slightly in favour of females (51.1% females) (Statistics Canada 2012).

In 2011, 1.5% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified.

- City of Burnaby Council unanimously motioned to oppose the Trans Mountain Expansion Project in May 2012.
- Air emissions and odours at the Burnaby Terminal and marine air emissions (Dittani pers. comm.).
- Noise associated with the Westridge Marine Terminal (Dittani pers. comm.).
- Noise associated with construction (Dittani pers. comm.).
- Need for formalized communications (Te pers. comm.).
- Disruption of transportation on the Burnaby Mountain Parkway (Te pers. comm.).
- At the Burnaby Community Workshop, it was noted that some community members have a personal history with the spill at Burrard Inlet in 2007.
- Concern regarding crime and robbery by transient workers was raised at the Burnaby Community Workshop.
- A sense of 'fatigue' from multiple construction developments in the same area across a short period of time was noted as an issue at the Burnaby Community Workshop.

6.6.3 Communities and Regions in the Socio-Economic Regional Study Area

This subsection presents information on communities and regions in the Socio-Economic RSA of the Metro Vancouver Region. Selected population, mobility and income statistics are located in Tables A-2, A-4 and A-6 in Appendix A.

Many communities in the Metro Vancouver Socio-Economic RSA have identified issues through direct consultation with Project representatives as well as information sessions and open houses. Many issues relate to tanker traffic, safe transit of tankers, spill response times and liability. Specifically, the following issues were identified.

- Concerns about whose responsibility it will be if there is a fire on the vessels (Welman pers. comm.).

- Concern regarding shipping lanes, traffic numbers between Haro Straight and the harbour and what the ships will be carrying (Ballem pers. comm.).

- Concerns about the relocation of spill response coordination to Ottawa (Sadhu Johnston pers. comm.).

- How frequently emergency response times are practiced (Jackson pers. comm.).

Further information regarding marine use issues raised in the Metro Vancouver area can be found in the Marine Commercial, Recreational and Tourism Use – Marine Transportation Technical Report of Volume 8B.

District of Maple Ridge

The District of Maple Ridge is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 1.4 km south from the District of Maple Ridge (geodesic distance from RK 1155.2). Maple Ridge is located approximately 44 km east of Vancouver in Metro Vancouver. Many residents of Maple Ridge commute to work in other communities. The district is looking to the twinning of the Port Mann Bridge to aid in job creation and new investments and to increase residential, commercial and industrial developments. The main economic drivers in Maple Ridge are agriculture, fisheries and forestry. Maple Ridge is also a popular destination for outdoor tourism with numerous trails, provincial parks and other recreational opportunities (District of Maple Ridge 2007).

In 2011, the District of Maple Ridge's population was 76,052, which is a 10.3% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 18.1% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 77.5% of the population in 2011. The median age is 40.2 years, which is younger than the provincial median age of 41.9 years. The population is weighted in favour of females (50.7% female) (Statistics Canada 2012).

In 2011, 3.6% of the population of the district identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

City of Langley

The City of Langley is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 5.5 km north from the City of Langley (geodesic distance from RK 1148). Langley is located directly adjacent the Township of Langley to the north, east and south and the City of Surrey to the west in Metro Vancouver. The City of Langley currently has the most active industrial and service commercial industries in the Lower Mainland (City of Langley 2013). The city has identified economic drivers to include industrial plastics manufacturing, metal fabrication, clothing manufacturing, warehousing, and a variety of multi-use workshops as essential to the economy (City of Langley 2013).

In 2011, the City of Langley's population was 25,081, which is a 5.2% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 15.8% of the population is between 0 and 14 years of age similar to 15.4% for BC. The workforce population (population between 15 and 64 years) was 72.8% of the population in 2011. The median age is 40.4 years, which is less than the provincial median age of 41.9 years. The population is weighted in favour of females (52.2% female) (Statistics Canada 2012).

In 2011, 5.1% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

City of Pitt Meadows

The City of Pitt Meadows is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 1.4 km south from the City of Pitt

Meadows (geodesic distance from RK 1155.2). Pitt Meadows is located 37 km east of Vancouver in Metro Vancouver. Pitt Meadows is a recreational city with a temperate climate, abundant green space, trails, parks and mountain vistas (City of Pitt Meadows 2007). Residents have access to affordable housing in comparison on the surrounding region (City of Pitt Meadows 2007). The main economic drivers are agricultural production, tourism and film production (City of Pitt Meadows 2007).

In 2011, the City of Pitt Meadows' population was 17,736, which is a 13.5% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 18.3% of the population is between 0 and 14 years of age greater than 15.4% for BC. The workforce population (population between 15 and 64 years) was 76.7% of the population in 2011. The median age is 39.5 years, which is less than the provincial median age of 41.9 years. The population is weighted in favour of females (51.3% female) (Statistics Canada 2012).

In 2011, 4.5% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

City of White Rock

The City of White Rock is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 17.3 km north from the City of White Rock (geodesic distance from RK 1158.6). White Rock is located approximately 45 km southeast of Vancouver and approximately 2 km north of the Canada–United States border in Metro Vancouver. The health care and social assistance sectors are the main employers for White Rock; Peace Arch Hospital is the city's main employer (Vann Struth Consulting Group 2009).

In 2011, the City of White Rock's population was 19,339, which is a 3.1% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 9.3% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 65.4% of the population in 2011. The median age is 53.8 years, which is greater than the provincial median age of 41.9 years. The population is weighted in favour of females (54.8% female) (Statistics Canada 2012).

In 2011, 2.5% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

City of Port Coquitlam

The City of Port Coquitlam is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 0.3 km southwest from the City of Port Coquitlam (geodesic distance from RK 1164.1). Port Coquitlam is located adjacent to the east of Coquitlam and forms part of the informal Tri-Cities with Coquitlam and Port Moody in Metro Vancouver. The city has a variety of recent commercial, institutional, industrial and residential developments. The main employers include industrial firms such as CP Rail, Sysco and Esco, commercial businesses such as Home Depot and Safeway, and government organizations such as the School District and the City of Port Coquitlam (City of Port Coquitlam 2010).

Issues identified from consultation include marine emergency response and safety.

In 2011, the City of Port Coquitlam's population was 56,342, which is a 6.9% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 17.4% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 79.9% of the population in 2011. The median age is 39.2 years, which is less than the provincial median age of 41.9 years. The population is weighted in favour of females (50.2% females) (Statistics Canada 2012).

In 2011, 3.2% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

City of New Westminster

The City of New Westminster is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 0.2 km northeast from the City of New Westminster (geodesic distance from RK 1173). New Westminster is located directly adjacent to Coquitlam to the southwest and Burnaby to the south in Metro Vancouver. The city is also bounded by the Fraser River to the southeast. New Westminster has various educational, cultural and commercial opportunities. New Westminster's economy thrives from health care and services, manufacturing, and commercial and retail activities (City of New Westminster 2013).

In 2011, the City of New Westminster's population was 65,976, which is a 12.7% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 13.1% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 78.4% of the population in 2011. The median age is 41.2 years, which is similar to the provincial median age of 41.9 years. The population is weighted in favour of females (51% female) (Statistics Canada 2012).

In 2011, 3.4% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

Corporation of Delta

The Corporation of Delta is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 5.4 km northeast from the Corporation of Delta (geodesic distance from RK 1173). Delta is located west of Surrey in Metro Vancouver. Delta incorporates the communities of Ladner, Tsawwassen and North Delta (Corporation of Delta 2012). The Corporation of Delta's key economic energy is within the fishing and agricultural industries (Corporation of Delta 2012).

Issues identified through consultation include emergency response and safety.

In 2011, the Corporation of Delta's population was 99,863, which is a 3.3% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 17.1% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 75.0% of the population in 2011. The median age is 42.8 years, which is older than the provincial median age of 41.9 years. The population is weighted in favour of females (50.9% female) (Statistics Canada 2012).

In 2011, 2.3% of the population of the corporation identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

City of Richmond

The City of Richmond is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 7.3 km northeast from the City of Richmond (geodesic distance from RK 1177.8). Richmond is located southwest of Burnaby in Metro Vancouver. The city has a combination of residential and commercial property, agricultural lands, industrial parks, waterways and natural areas. The city's primary industries include tourism, technology industries, light manufacturing, airport services and aviation, agriculture and fishing (City of Richmond 2012). Richmond is becoming a leader in high technology industries (City of Richmond 2012).

Issues identified from consultation include emergency response, cumulative effects, and environmental permitting.

In 2011, the City of Richmond's population was 190,473, which is a 9.2% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 14.4% of the population is between 0 and 14 years of age similar to 15.4% for BC. The workforce population (population between 15 and 64 years) was 78.6% of the population in 2011. The median age is 42.1

years, which is similar to the provincial median age of 41.9 years. The population is weighted in favour of females (52.1% female) (Statistics Canada 2012).

In 2011, 1.0% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

City of Port Moody

The City of Port Moody is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 1.4 km southwest from the City of Port Moody (geodesic distance from RK 1183.6). Port Moody is located adjacent to the north and west of Coquitlam and forms part of the informal Tri-Cities with Coquitlam and Port Coquitlam in Metro Vancouver. Economic drivers in Port Moody revolve around the railroad and harbour derived from light industry and warehousing such as petro distribution operations and harbour terminals. The city's economic development strategy promotes a mix of residential, commercial, manufacturing, and business to maintain a diverse economy while maintaining and creating new jobs through redevelopment (City of Port Moody 2013). An economic shift towards a waterfront economic plan may be in the City's future as heavy industries are reduced (City of Port Moody 2013).

In 2011, the City of Port Moody's population was 32,975, which is a 19.9% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 18.5% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 79.1% of the population in 2011. The median age is 38.4 years, which is less than the provincial median age of 41.9 years. The population is weighted in favour of females (50.6% female) (Statistics Canada 2012).

In 2011, 2.6% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

Village of Anmore

The Village of Anmore is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 5.7 km southwest from the Village of Anmore (geodesic distance from RK 1180.8). Anmore is located northeast of Burnaby on the north side of the Burrard Inlet in Metro Vancouver. The Village of Anmore is a rural community with limited services and abundant outdoor recreational opportunities (Village of Anmore 2009). The village does not operate any recreation facilities; however, the village attracts tourists due to its natural recreation resources (Village of Anmore 2009). Tourism is the main economic driver in Anmore (Village of Anmore 2009).

In 2011, the Village of Anmore's population was 2,092, which is a 17.2% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 19.9% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 82.2% of the population in 2011. The median age is 40.9 years, which is younger than the provincial median age of 41.9 years. The population is weighted in favour of females (50.7% female) (Statistics Canada 2012).

In 2011, none of the population of the village identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

Village of Belcarra

The Village of Belcarra is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 3.1 km southwest from the Village of Belcarra (geodesic distance from RK 1183.6). Belcarra is located northeast of Burnaby on the north side of Burrard Inlet in Metro Vancouver. Belcarra's main economic drivers are forestry, fishing and film. Local employment is within the education sector, government services, business, sales and service. The village is a self-described "island community" due to its close proximity to the marine waters of Indian Arm and

Port Moody Arm. Belcarra Regional Park is one of the largest parks in Metro Vancouver, used by residents and visitors (Village of Belcarra 2013).

Issues identified from consultation include emergency response and safety.

In 2011, the Village of Belcarra's population was 644, which is a 4.7% decrease from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 11.6% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 71.4% of the population in 2011. The median age is 52.1 years, which is greater than the provincial median age of 41.9 years. The population is weighted in favour of females (51.9% female) (Statistics Canada 2012).

In 2011, 6.2% of the population of the village identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

District of North Vancouver

The District of North Vancouver is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 0.8 km south from the District of North Vancouver (geodesic distance from RK 1183.4). North Vancouver is located north of Burnaby on the north side of the Burrard Inlet in Metro Vancouver. North Vancouver offers a range of diverse opportunities for economic activity such as office and retail, employment in schools and universities and home-based businesses. The main economic drivers in the District are television, film and industry (District of North Vancouver 2011).

Issues identified from consultation include emergency response, safety, noise, risk management, Aboriginal consultation and benefits.

In 2011, the District of North Vancouver's population was 84,412, which is a 2.2% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 17.1% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 74.9% of the population in 2011. The median age is 43.4 years, which is greater than the provincial median age of 41.9 years. The population is weighted in favour of females (51.5% female) (Statistics Canada 2012).

In 2011, 1.3% of the population of the district identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

City of Vancouver

The City of Vancouver is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 4.7 km east from the City of Vancouver (from RK 1183.4). Vancouver is located adjacent to and west of Burnaby in Metro Vancouver. The main economic drivers are trade, film, natural resources, technology and tourism (City of Vancouver 2012). The city's industries are changing focus to clean energy and technology (Vancouver Economic Commission 2011). Green jobs focus on business growth and new investments that drive employment, exports and global trade in a sustainable manner (Vancouver Economic Commission 2011).

In 2011, the City of Vancouver's population was 603,502, which is a 4.4% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 11.8% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 79.4% of the population in 2011. The median age is 39.7 years, which is similar to the provincial median age of 41.9 years. The population is weighted in favour of females (51.1% female) (Statistics Canada 2013a).

In 2011, 2.0% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

City of North Vancouver

The City of North Vancouver is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 5.8 km east from the City of North Vancouver (geodesic distance from RK 1183.4). North Vancouver is located on the north side of the Burrard Inlet in Metro Vancouver. The city estimates that the waterfront/port industry and the potential for development densification will create approximately 31,130 jobs in the city by 2021. The main economic drivers are land and light industrial, office-based companies, filming, and tourism-related industries such as retail trade, accommodation, food services, and arts and culture (City of North Vancouver 2011).

Issues identified from consultation include emergency response and climate change.

In 2011, the City of North Vancouver's population was 48,196, which is a 6.7% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 13.5% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 74.9% of the population in 2011. The median age is 41.2 years, which is similar to the provincial median age of 41.9 years. The population is weighted in favour of females (52.5% female) (Statistics Canada 2012).

In 2011, 2.3% of the population of the city identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

District of West Vancouver

The District of West Vancouver is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 12.2 km southeast from the District of West Vancouver (geodesic distance from RK 1183.4). West Vancouver is located north of Vancouver in Metro Vancouver. The main economic drivers consist of retail, service and recreational activities. Within the city neighbourhood business areas serve the needs of local residents (District of West Vancouver 2008).

Issues identified from consultation include emergency response, tanker management, air quality, water quality, visual (tanks in harbour). The District of West Vancouver Council passed a motion on July 23, 2012 opposing the Project.

In 2011, the District of West Vancouver's population was 42,694, which is a 1.3% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 13.8% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 67.9% of the population in 2011. The median age is 49.9 years, which is greater than the provincial median age of 41.9 years. The population is weighted in favour of females (53.2% female) (Statistics Canada 2012).

In 2011, 0.6% of the population of the district identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

Village of Lions Bay

The Village of Lions Bay is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 26.3 km southeast from the Village of Lions Bay (geodesic distance from RK 1183.4). Lions Bay is located approximately 11 km north of Horseshoe Bay in Metro Vancouver. The Sea to Sky Highway runs through the village. Lions Bay is one of the smallest municipalities in BC (Village of Lions Bay 2012).

In 2011, the Village of Lions Bay's population was 1,318, which is a 0.8% decrease from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 14.4% of the population is between 0 and 14 years of age similar to 15.4% for BC. The workforce population (population between 15 and 64 years) was 74.0% of the population in 2011. The median age is 48.7

years, which is older than the provincial median age of 41.9 years. The population is weighted in favour of males (50.2% male) (Statistics Canada 2012).

In 2011, 1.1% of the population of the village identified as Aboriginal. This compares to 5.4% for the province of BC (Statistics Canada 2013a).

Bowen Island, Island Municipality

The Island Municipality of Bowen Island is not crossed by the proposed pipeline corridor but is located in the Socio-Economic RSA. The proposed pipeline corridor is located 27.6 km southeast from Bowen Island (geodesic distance from RK 1183.4). Bowen Island is located approximately 25 km northwest of Vancouver in Metro Vancouver. It is accessible by boat and water taxi from Vancouver and a ferry operated by BC Ferries from Horseshoe Bay (Destination BC 2013). Bowen Island is the sole municipality in the Islands Trust, legislated by the *Islands Trust Act*, which protects and preserves the islands and waters between southern Vancouver Island and the mainland, or the Islands Trust Area (Islands Trust 2008). Bowen Island's small local economy is driven by a seasonal tourism industry (Bowen Island Chamber of Commerce 2013).

In 2011, Bowen Island's population was 3,402, which is a 1.2% increase from 2006. The provincial population increased approximately 7.0% over the same period. Approximately 18.2% of the population is between 0 and 14 years of age compared to 15.4% for BC. The workforce population (population between 15 and 64 years) was 72.3% of the population in 2011. The median age is 46.6 years, which is greater than the provincial median age of 41.9 years. The population is weighted in favour of females (51.7% female) (Statistics Canada 2012).

Aboriginal identity data is not available for Bowen Island, Island Municipality.

7.0 EXISTING CONDITIONS – HUMAN OCCUPANCY AND RESOURCE USE

This subsection describes the current non-traditional land and resource occupancy and use in the HORU RSA, by each socio-economic region. The spatial boundary for the HORU RSA are shown on Figures 3.3-5 to 3.3-10 in Section 3.3 of this report, and includes the RSA boundaries of fish and fish habitat, wetlands, vegetation and wildlife elements from Volume 5A. The HORU RSA was selected to reflect the resource-use related elements that could be indirectly affected by the Project (*e.g.,* consumptive and non-consumptive recreation, hunting, trapping and fishing).

This subsection provides information relating to:

- parks and protected areas;
- residential use;
- IRs and traditional territories;
- agricultural use;
- outdoor recreational use;
- non-traditional hunting, trapping and fishing;
- managed forest areas;
- minerals, aggregates and oil and gas resources;
- industrial and commercial use;
- water supply and use;
- aesthetic attributes; and
- marine commercial, recreational and tourism use.

While this section touches on Aboriginal land and resource use, traditional land and resource use is discussed in a comprehensive manner in the Traditional Land and Resource Use Technical Report (Volume 5D). Navigable waters is addressed in Section 9.0 Navigation and Navigation Safety.

The proposed pipeline corridor will cross a portion of west-central Alberta and the entire width of BC. Given the size of the Project, it crosses a wide range of terrain and geographies. Of the land within the proposed pipeline corridor, approximately 75.3% is privately owned, 24.4% is Crown land and 0.3% is Aboriginal (IRs).

The Alberta portion of the proposed pipeline corridor crosses various areas of land use including agricultural, commercial, industrial, oil and gas, recreational, rural and urban residential and trapping areas. Of the land in the Alberta portion of the proposed pipeline corridor, approximately 68.0% is privately owned and approximately 32.0% is Crown land.

The BC portion of the proposed pipeline corridor also crosses various areas of land use, including agricultural, commercial, forestry, industrial, mining, recreational, rural and urban residential, trapping areas, guide outfitting areas and tourism. Of the land in the BC portion of the proposed pipeline corridor, approximately 77.7% is privately owned and approximately 21.8%% is Crown land.

Current and future land use in the vicinity of the proposed pipeline corridor is governed by a wide range of land use and development plans. Key land use plans that are crossed by the proposed pipeline corridor are listed in Table 7.0-1. There are numerous regional and municipal land use and development plans whose jurisdictions are crossed by the proposed pipeline corridor. The Project will cross areas zoned or otherwise noted for a range of land uses or protection, including: environmental significance; residential and future residential; commercial and industrial; parks, open spaces and natural areas within urban settings; trail systems; resource/mineral potential; and community watersheds. In the Alberta regions, some plans account for the likelihoods of pipeline development and provide guiding parameters to ensure compatibility between pipeline development and other land other uses, which the Project will follow. Most plans in BC do not explicitly discuss the coordination of pipeline activity in the context of other uses. Trans Mountain anticipates engaging with municipal representatives to ensure the principals and vision of long-term land development in the areas through which the Project passes are respected and adhered to.

TABLE 7.0-1

KEY LAND USE PLANS IN THE PROPOSED PIPELINE CORRIDOR AND HUMAN OCCUPANCY AND RESOURCE USE LOCAL STUDY AREA

Socio-Economic Region	Land Use Plan/Strategy
Edmonton Region	• Strathcona County MDP Bylaw 1-2007 • The Way We Grow: MDP, Bylaw 15100 (City of Edmonton) • Your Bright Future: MDP 2010-2020 (City of Spruce Grove) • Entwistle Area Structure Plan Bylaw No. 23-2012 • Parkland County MDP, Bylaw No. 37-2007 • Parkland County Land Use Bylaw No. 20-2009 • Town of Stony Plain MDP 2005-2020 • Village of Wabamun MDP
Rural Alberta Region	• Yellowhead County MDP Bylaw No. 1.06 • Yellowhead County Land Use Bylaw No. 2.06 • Town of Edson MDP • Edson Urban Fringe Intermunicipal Development Plan • Town of Hinton MDP • Town of Hinton Community Development and Enhancement Plan • Hamlet of Evansburg Area Structure Plan Bylaw No. 12.03 • Hamlet of Wildwood Area Structure Plan • Coal Branch Sub-Regional Integrated Resource Plan • The Northern East Slopes Sustainable Resource and Environmental Management Strategy
Jasper National Park Region	• Jasper Community Sustainability Plan • Jasper National Park of Canada Management Plan
Fraser-Fort George/Thompson-Nicola Region	• Robson Valley-Canoe Upstream OCP • Valemount to Blue River Winter Recreation SRMP • Robson Valley Land and Resource Management Plan-Summary • Eight Peaks Winter Recreation SRMP • Village of Valemount OCP • Blue River OCP • Avola OCP • District of Clearwater OCP • Nicola Valley OCP • Kamloops LRMP • KAMPLAN OCP (City of Kamloops) • Kamloops North OCP • Kamloops Airport Area Land Use and Development Plan • Thompson-Nicola Regional District Zoning Bylaw No. 2400, 2012 • City of Merritt OCP • City of Merritt Zoning Bylaw No. 1894, 2004
Fraser Valley Region	• Fraser Valley Regional District OCP for Popkum-Bridal Falls part of Electoral Area “D” • Fraser Valley Regional District OCP for Portions of Electoral Area “B” Yale, Emory Creek, Dogwood Valley and Choate Bylaw No. 150, 1998 • Fraser Valley Regional District OCP for Electoral Area “E” Bylaw No. 1115, 2011 • Chilliwack Forest District SRMP • District of Hope OCP • City of Chilliwack OCP • City of Chilliwack Zoning Bylaw 2011 • City of Abbotsford OCP
Metro Vancouver Region	• GVRD OCP • Township of Langley OCP • City of Coquitlam Citywide OCP • Coquitlam Lougheed Neighbourhood Plan • City of Surrey OCP • Burnaby OCP • Port Metro Vancouver Consolidated Land Use Plan • Vancouver Fraser Port Authority Land Use Plan

7.1 Parks and Protected Areas

This subsection identifies parks and protected areas with known human use along and close to the proposed pipeline corridor within each Socio economic Region. This includes national parks, national park reserves, national wildlife areas, provincial parks, municipal and regional parks, conservation areas, conservancies, protected areas, ecological reserves, natural areas, established recreation areas, wildlife management areas, wildlife sanctuaries, Canadian Heritage Rivers, migratory bird sanctuaries, world biosphere reserves, Ramsar wetlands, national historic sites of Canada, world heritage sites or Ducks Unlimited Canada projects. Figures 7.1-1 through 7.1-6 provide a summary of provincial parks, protected areas and recreation areas crossed by the proposed pipeline corridor.

Additional information on protected or conservation areas with an environmental or biological protection purpose is found in the Wildlife and Wildlife Habitat Technical Report, Fisheries (Alberta) Technical Report, Fisheries (British Columbia) Technical Report, Vegetation Technical Report and Wetland Evaluation Technical Report of Volume 5C.

TRANS MOUNTAIN

FIGURE 7.1-1

PROVINCIAL PARKS, PROTECTED AREAS AND RECREATION AREAS – EDMONTON REGION

TRANS MOUNTAIN EXPANSION PROJECT

- Kilometre Post (KP)
- Reference Kilometre Post (RK)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Terminal
- Pump Station (Pump Additions, Station Modifications and/or Scraper Facilities)
- Pump Station (Reactivated)
- Existing Pump Station
- Highway
- Railway
- HORU RSA Boundary
- HORU LSA Boundary
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- Transportation and Utility Corridor (TUC)
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Municipal / District Boundary

Projection: NAD 1983 UTM 11N. Routing: Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, Aug. 23, 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infrstructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: ESRI, 2009.

TERA ENVIRONMENTAL CONSULTANTS

Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

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ALL LOCATIONS APPROXIMATE

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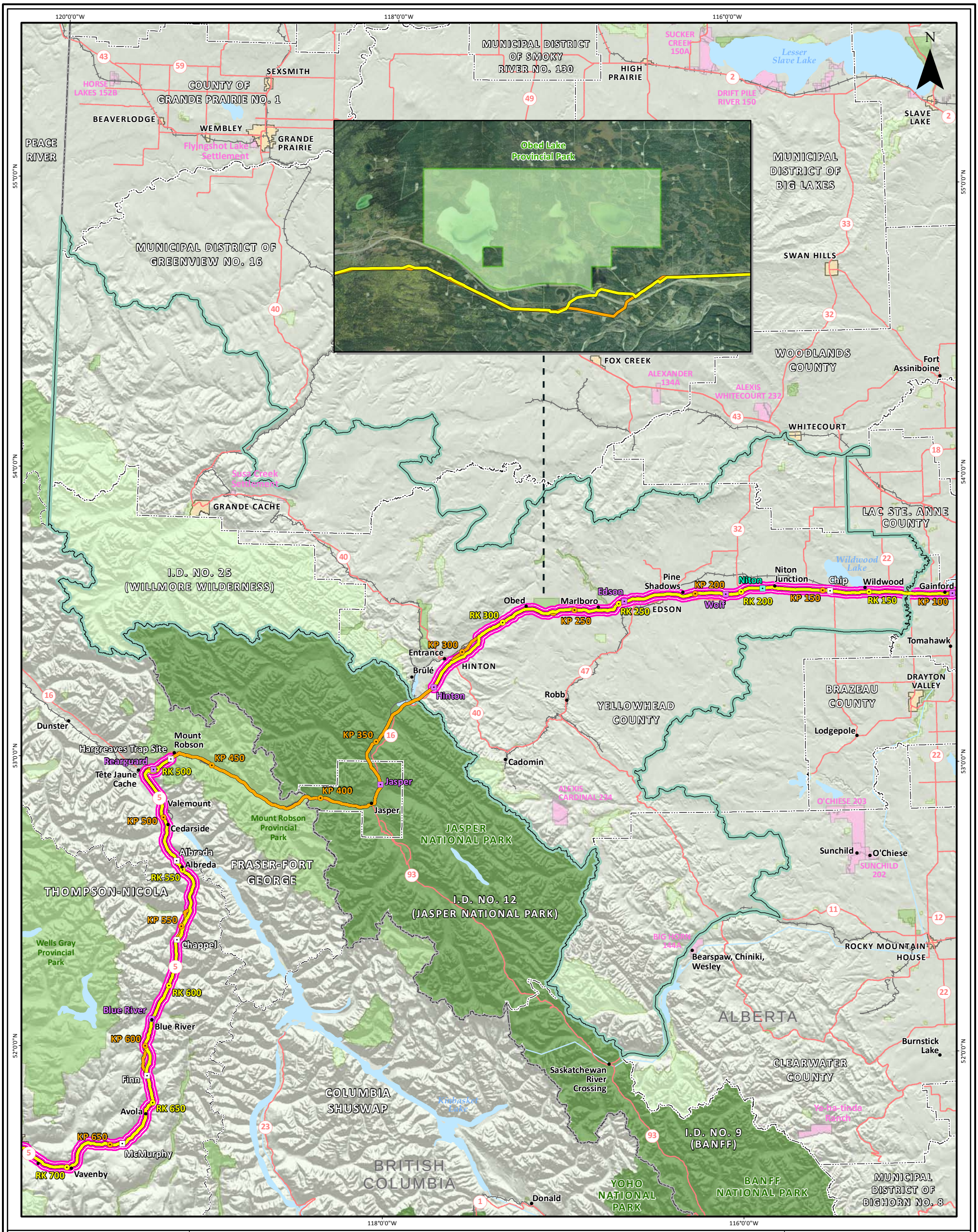

tera ENVIRONMENTAL CONSULTANTS

- Town / Village / Hamlet
- Kilometre Post (KP)
- Reference Kilometre Post (RK)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Pump Station (Pump Additions, Station Modifications and/or Scraper Facilities)
- Pump Station (Reactivated)
- Existing Pump Station
- Highway
- Railway
- HORU RSA Boundary
- HORU LSA Boundary
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Regional District Boundary
- Provincial Boundary

Projection: NAD 1983 UTM 11N. Routing: Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, Aug. 23, 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infrstructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: ESRI, 2009.

TRANS MOUNTAIN

FIGURE 7.1-2

PROVINCIAL PARKS, PROTECTED AREAS AND RECREATION AREAS – RURAL ALBERTA REGION

TRANS MOUNTAIN EXPANSION PROJECT

MAP NUMBER 201310_MAP_TERA_SE_00463_REV0_02		PAGE SHEET 2 OF 6
DATE December 2013	TERA REF. 7894	REVISION 0
SCALE 1:1,400,000	PAGE SIZE 11x17	DISCIPLINE SE
DRAWN AJS	CHECKED TGG	DESIGN TGG

0 10 20 30 40 50 Km

ALL LOCATIONS APPROXIMATE

TRANSMOUNTAIN

FIGURE 7.1-3

PROVINCIAL PARKS, PROTECTED AREAS AND RECREATION AREAS – JASPER NATIONAL PARK REGION

TRANS MOUNTAIN EXPANSION PROJECT

- Town / Village / Hamlet
- Kilometre Post (KP)
- Reference Kilometre Post (RK)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Pump Station (Pump Additions, Station Modifications and/or Scraper Facilities)
- Existing Pump Station
- Highway
- Railway
- HORU RSA Boundary
- HORU LSA Boundary
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Municipal / District Boundary
- Provincial Boundary

Projection: NAD 1983 UTM 11N. Routing: Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, Aug. 23, 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infrstructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: ESRI, 2009.

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MAP NUMBER: 201310_MAP_TERA_SE_00463_REV0_03		PAGE: SHEET 3 OF 6
DATE: December 2013	TERA REF.: 7894	REVISION: 0
SCALE: 1:650,000	PAGE SIZE: 11x17	DISCIPLINE: SE
DRAWN: AJS	CHECKED: TGG	DESIGN: TGG

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ALL LOCATIONS APPROXIMATE

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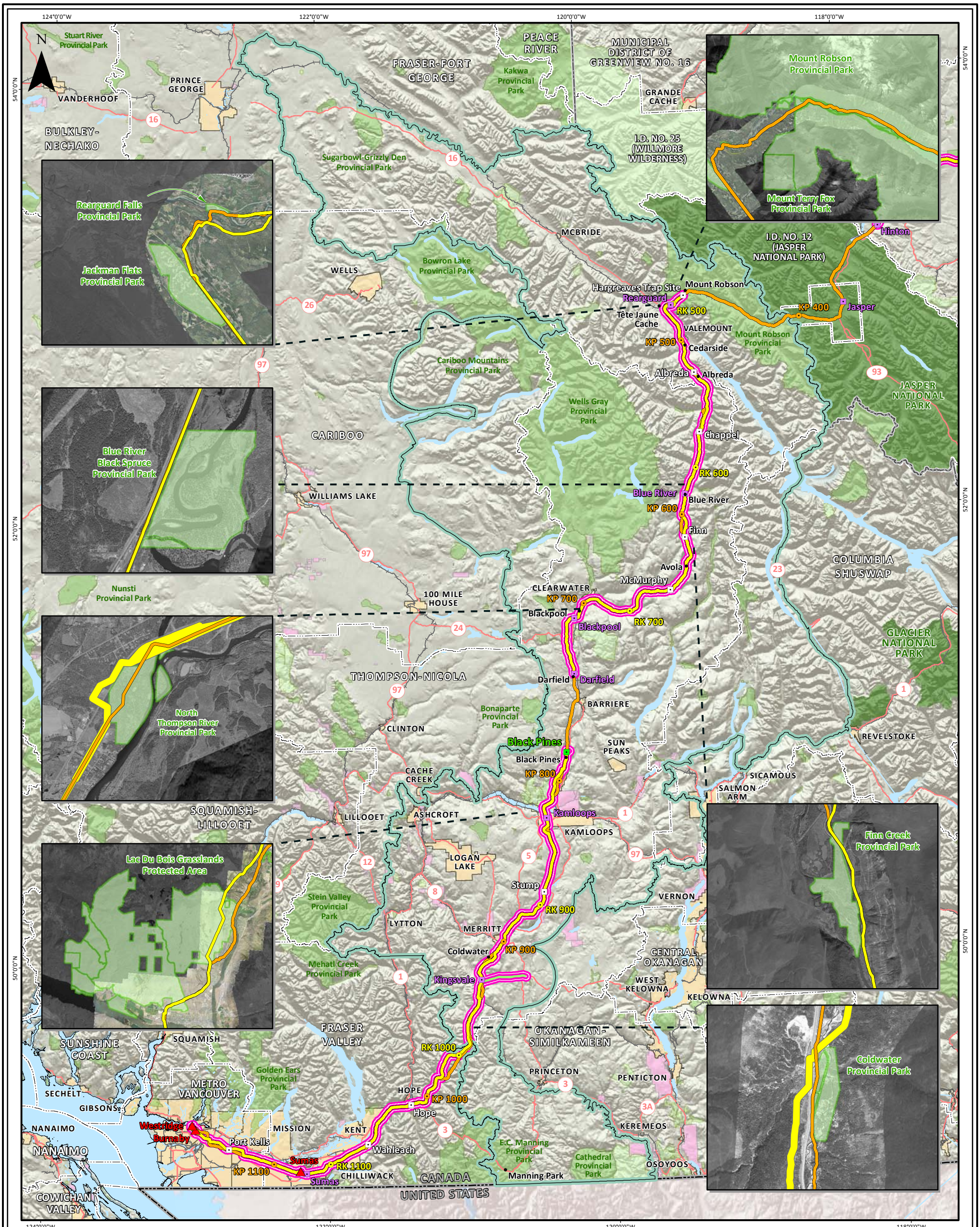

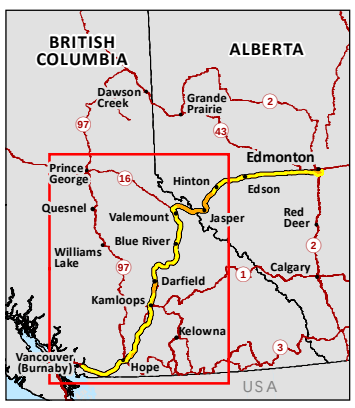

tera ENVIRONMENTAL CONSULTANTS

- Town / Village / Hamlet
- Reference Kilometre Post (RK)
- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Terminal
- Pump Station (Pump Additions, Station Modifications and/or Scraper Facilities)
- New Pump Station (Proposed)
- Existing Pump Station
- Highway
- Railway
- HORU RSA Boundary
- HORU LSA Boundary
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Regional District Boundary
- Provincial Boundary
- International Boundary

Projection: NAD 1983 UTM 10N. Routing: Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, Aug. 23, 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infrstructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: Copyright:© 2013 Esri.

TRANS MOUNTAIN

FIGURE 7.1-4

PROVINCIAL PARKS, PROTECTED AREAS AND RECREATION AREAS – FRASER-FORT GEORGE / THOMPSON-NICOLA REGION

TRANS MOUNTAIN EXPANSION PROJECT

MAP NUMBER 201310_MAP_TERA_SE_00463_REV0_04		PAGE SHEET 4 OF 6
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SCALE 1:1,850,000	PAGE SIZE 11x17	DISCIPLINE SE
DRAWN AJS	CHECKED TGG	DESIGN TGG

0 20 40 60 80 Km

ALL LOCATIONS APPROXIMTE

TRANS MOUNTAIN

FIGURE 7.1-5

PROVINCIAL PARKS, PROTECTED AREAS AND RECREATION AREAS – FRASER VALLEY REGION

TRANS MOUNTAIN EXPANSION PROJECT

- Kilometre Post (KP)
- Reference Kilometre Post (RK)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Terminal
- Pump Station (Pump Additions, Station Modifications and/or Scraper Facilities)
- Existing Pump Station
- Highway
- Railway
- HORU RSA Boundary
- HORU LSA Boundary
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Municipal / District Boundary
- International Boundary

Projection: NAD 1983 UTM 10N. Routing: Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, Aug. 23, 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infrstructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: Copyright© 2013 Esri.

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MAP NUMBER: 201310_MAP_TERA_SE_00463_REV0_05		PAGE: SHEET 5 OF 6
DATE: December 2013	TERA REF.: 7894	REVISION: 0
SCALE: 1:550,000	PAGE SIZE: 11x17	DISCIPLINE: SE
DRAWN: AJS	CHECKED: TGG	DESIGN: TGG

0 4 8 12 16 20 km

ALL LOCATIONS APPROXIMATE

201310_MAP_TERA_SE_00463_Rev0_05.mxd

TRANS MOUNTAIN

FIGURE 7.1-6

PROVINCIAL PARKS, PROTECTED AREAS AND RECREATION AREAS – METRO VANCOUVER REGION

TRANS MOUNTAIN EXPANSION PROJECT

- Kilometre Post (KP)
- Reference Kilometre Post (RK)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Terminal
- Existing Pump Station
- Highway
- Railway
- HORU RSA Boundary
- HORU LSA Boundary
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Municipal / District Boundary
- International Boundary

Projection: NAD 1983 UTM 10N. Routing: Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, Aug. 23, 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infrstructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: Copyright:© 2013 Esri.

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MAP NUMBER 201310_MAP_TERA_SE_00463_REV0_06		PAGE SHEET 6 OF 6
DATE December 2013	TERA REF. 7894	REVISION 0
SCALE 1:300,000	PAGE SIZE 11x17	DISCIPLINE SE
DRAWN AJS	CHECKED TGG	DESIGN TGG

km 0 2 4 6 8 10

ALL LOCATIONS APPROXIMATE

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Parks and protected areas with a known human use along the proposed pipeline corridor are listed in Table 7.1-1; those in the HORU LSA are listed in Table 7.1-2. respectively.

TABLE 7.1-1

PARKS AND PROTECTED AREAS CROSSED BY THE PROPOSED PIPELINE CORRIDOR

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
EDMONTON REGION				
Menisa	Municipal Park	• Menisa Park is a municipal park in the City of Edmonton. The park was named in October, 1984.	Unknown	Approximately RK 20.0 to RK 20.5
Richford	Municipal Park	• Richford Park is a municipal park located in the City of Edmonton.	Unknown	Approximately RK 24.5 to RK 24.7
Granville	Municipal Park	• Granville Park is a municipal park located in the City of Edmonton.	Unknown	Approximately RK 42.8 to RK 43
RURAL ALBERTA REGION				
No parks and protected areas are along the proposed pipeline corridor in the Rural Alberta Region.				
FRASER-FORT GEORGE/THOMPSON-NICOLA REGION				
Fraser River	Canadian Heritage River	• The Canadian Heritage Rivers System (CHRS) designated the Fraser River as a Canadian Heritage River in 1998. The Fraser River is largest river in BC (1,375 km), contains high value salmon habitat as well as staging and nesting areas for shorebirds and waterfowl. The river also contains high recreation values including fishing, rafting and boating. The headwaters are located in the Rocky Mountain Range, while the lower reaches and delta are located in the Lower Mainland, facilitating the development of the port of Vancouver.	N/A	RK 499.7
Finn Creek	Class A Provincial Park	• Established in 1996 as a result of recommendations made in the Kamloops LRMP. Grizzly bear, moose Chinook, coho and bull trout spawning habitat is present within the park. No facilities or services are located within the park. Management objectives for the park include maintaining the natural qualities and conditions of the park, fostering relationships with Aboriginal communities, maintaining visual, recreational and tourism values, maintaining diversity of wildlife species and habitats, allowing for continued casual recreation use, discouraging the introduction of non-native plant species and recognizing the long term potential to develop day and overnight facilities.	303	RK 638.7 to RK 639.3
North Thompson River	Class A Provincial Park	• Park offers picnicking, fishing, camping, and hiking opportunities. Established in 1967 with a campground on the shores of the Clearwater and North Thompson Rivers. The primary role of the park is to serve as a strategically situated overnight and stay-use stopover for the travelling public on Highway 5. As a secondary role, the park conserves river riparian habitats and a small but important example of the IDFmw2 subzone/variant. As a tertiary role, the park protects locally important archaeological values (kekuli pits).	126	RK 725.5 to RK 725.9
Lac du Bois Grasslands	Protected Area	• The protected area was established in 1996 resulting from the Kamloops LRMP process, and includes two Ecological Reserves: McQueen Creek Ecological Reserve and Tranquille Ecological Reserve. • The Lac du Bois Grasslands Protected Area encompasses native grassland communities, dry forests, rock outcrops, canyons, wetlands, ponds and small lakes. • The BC Ministry of Environment (MOE) is currently proposing additions to the protected area. These would extend the protected area east near the Rayleigh community and south with the Bachelor and Bachelor South additions.	15,000	RK 829.0 to RK 836.9

TABLE 7.1-1 Cont'd

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
Ord Road	Municipal Dog Park	• Ord Road Dog Exercise Park is a municipal off-leash area for dogs in the City of Kamloops.	Unknown	Approximately RK 844.8 to RK 844.9
Kenna Cartwright	Municipal Nature Park	• Kenna Cartwright Nature Park is located in the City of Kamloops. It is the largest municipal park in BC and includes over 40 km of trails for hiking or cycling.	800	Approximately RK 848.4 to RK 850
FRASER VALLEY REGION				
Coquihalla Summit	Recreation Area	• The recreation area was established in 1987 and contains four BGC zones and recreation activities such as fishing, hunting, horseback riding and hiking.	5,750	RK 992.4 to RK 1005.2
F.H. Barber[2]	Class A Provincial Park	• Established in 1978 to offer public access to the Fraser River.	8.5	RK 1062.8 to RK 1062.9
Cheam Lake Wetlands	Regional Park	• Cheam Lake Wetlands is a regional park located in Electoral Area D of the FVRD. The park's natural features include a lake, marsh and forested land. Recreational amenities include a 2 km trail system and wildlife viewing and picnicking opportunities.	107	Approximately RK 1080.1 to RK 1080.4
Straiton	Municipal Park	• Straiton Park is a 0.7 km municipal woodland trail in the City of Abbotsford.	Unknown	RK 1119.7 to RK 1120.3
METRO VANCOUVER REGION				
Ponder	Municipal Park	• Ponder Park is a municipal park in the Township of Langley. The park contains trails and a treed nature area.	Unknown	Approximately RK 1142.5 to RK 1143.3
Hope Redwoods	Municipal Natural Area	• Hope Redwood Natural Area is located in the Township of Langley. The natural area includes trails and a treed nature area.	Unknown	Approximately RK 1151.2 to RK 1151.5
Greenbelt (28A)	Municipal Natural Area	• Greenbelts are natural linear areas in the City of Surrey designed to connect parks and open spaces.	Unknown	Approximately RK 1158.2 to RK 1159
Greenbelt (27A)	Municipal Natural Area	• Greenbelts are natural linear areas in the City of Surrey designed to connect parks and open spaces.	Unknown	Approximately RK 1159.4 to RK 1159.5
Surrey Bend	Regional Park	• Surrey Bend Park is located in the northeast of the City of Surrey on the Fraser River and is owned by the City of Surrey and Metro Vancouver. The Surrey Bend Park protects a large undyked wetland in the lower Fraser River basin. Surrey Bend Park contains diverse wetland types and habitats for wildlife species. • The City of Surrey and Metro Vancouver initiated the development of a Management Plan for the park in 2009. The Management Plan endeavours to protect the unique natural characteristics of the park as well as provide recreational opportunities. The Management Plan includes a Concept Plan delineating the proposed locations of unfragmented areas of sensitive wetland habitats as well as recreational opportunities such as trails and a viewing pier and car park. The City of Surrey website notes that the development of park amenities is anticipated in the next two years.	348	Approximately RK 1160.5 to RK 1163.7
Fraser River	Canadian Heritage River	• The CHRS designated the Fraser River as a Canadian Heritage River in 1998. The Fraser River is largest river in BC (1,375 km), contains high value salmon habitat as well as staging and nesting areas for shorebirds and waterfowl. The river also contains high recreation values including fishing, rafting and boating. The headwaters are located in the Rocky Mountain Range, while the lower reaches and delta are located in the Lower Mainland, facilitating the development of the port of Vancouver.	N/A	RK 1168.9

TABLE 7.1-1 Cont'd

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
Brunette River	Municipal Conservation Area	• The Brunette River Conservation Area forms part of Burnaby's Central Valley and drains into the Fraser River from Burnaby Lake. This river has a rich cultural heritage; the Kwantlen First Nations people had winter villages at this location. In recent years, volunteer organizations have worked to help re-establish the fish and wildlife populations of the river. The Brunette River watershed provides critical salmon habitat. The Brunette River Conservation Area contains a trail that follows the banks of the river.	Unknown	Approximately RK 1176.6
Meadowood	Municipal Neighbourhood Park	• Meadowood Park is a municipal neighbourhood park in the City of Burnaby.	0.7	Approximately RK 1179.2 to RK 1179.3
Burnaby Mountain	Municipal Conservation Area	• Burnaby Mountain was established in 1930 and the Burnaby Mountain Conservation Area Plan was adopted by City of Burnaby Council in 1977. The Burnaby OCP notes that contemporary management plans are under preparation for Burnaby Mountain. The City of Burnaby is working towards consolidating ownership of the entire designated park and conservation area (700 ha). Burnaby Mountain is viewed as an important natural feature in the City and surrounding region. Within the conservation area boundaries are two industrial sites designated for petroleum storage and distribution uses, Trans Mountain's Burnaby terminal and a Petro Canada facility. • Burnaby Mountain offers environmental and recreational values. Burnaby Mountain contains numerous trails of varying difficulty and use and forms the headwaters of watersheds that drain into Burrard Inlet and Central Valley watersheds. Goals of the conservation area are to limit and regulate development in order to protect the natural area. The Burnaby Mountain Park and Conservation System includes Burnaby Mountain Conservation Area, Naheeno Park, Simon Fraser University Conservation Lands and Forest Grove Conservation Area.	700	Approximately RK 0.3 to RK 1
Westridge	Municipal Neighbourhood Park	• Westridge Park offers amenities related to sun-heated wading pools.	2.9	Approximately RK 1.6 to RK 1.8
Burrard Inlet	Municipal Conservation Area	• The Burrard Inlet Conservation Area is part of the City of Burnaby's park and conservation system on the Burrard Inlet foreshore. It is currently not fully developed.	2.3	Approximately RK 2 to RK 2.4

Sources: ATPR 2012, BC Integrated Land Management Bureau (ILMB) 1999, BC Parks 2013a, BC Parks 2013b, CHRS 2013, City of Abbotsford 2013, City of Burnaby 1998, City of Burnaby 2013, City of Chilliwack 2013, City of Coquitlam 2013, City of Edmonton 2013a, City of Kamloops 2013, City of New Westminster 2013, , City of Spruce Grove 2013, City of Surrey 2010, City of Surrey 2013, FVRD 2008, Parkland County 2013, Tourism Burnaby 2013, Township of Langley 2013, Vyse and Clarke 2000

Notes: 1 Locations are approximate.

2 Though F.H. Barber Provincial Park is crossed briefly by the proposed pipeline corridor, Trans Mountain has determined the final right-of-way will avoid this park.

TABLE 7.1-2

PARKS AND PROTECTED AREAS IN THE HUMAN OCCUPANCY AND RESOURCE USE LOCAL STUDY AREA

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
EDMONTON REGION				
Strathcona Science	Provincial Park	• The park is connected to Rundle Park by a pedestrian bridge and is a part of the Capital City Park trail system. It is within the Parkland-Central Parkland Natural Region. The park has no facilities on-site but does allow for recreational activities such as tobogganing, mountain biking and cycling, hiking, downhill and cross country skiing.	109.2	1.1 km from RK 0.0
Village Park	Municipal Park	• Village Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.6 km from RK 4.0
Fountain Creek	Municipal Park	• Fountain Creek Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.8 km from RK 6.0
Maple Ridge Industrial	Municipal Park	• Maple Ridge Industrial Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.9 km from RK 6.5
Ivor Dent	Municipal Sports Park	• Ivor Dent Sports Park is a tournament facility offering soccer, rugby and cricket fields.	55.8	Approximately 0.8 km from RK 17.5
Charlesworth	Municipal Park	• Charlesworth Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.7 km from RK 18.5
Thomas Opalinski	Municipal Park	• Thomas Opalinski Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.9 km from RK 23.5
Big Bear	Municipal Park	• Big Bear Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.4 km from RK 24.0
MacEwan	Municipal Park	• MacEwan Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.4 km from RK 25.5
Whitemud Ravine	Municipal Nature Reserve / Park	• Whitemud Ravine Park is located adjacent to Whitemud Nature Reserve in the City of Edmonton. The park offers the Alfred H. Savage Centre with washrooms and warm-up space. The park has on-site parking, picnic sites and hiking trails.	Unknown	Approximately 0.1 km from RK 28.0
Terwillegar South	Municipal Park	• Terwillegar Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.1 km from RK 29
Windermere Ravine	Municipal Park	• Windermere Ravine Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.3 km from RK 32.5
Cameron Heights	Municipal Park	• Cameron Heights Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.8 km from RK 36
Rural West	Municipal Park	• Rural West Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.9 km from RK 36.5
The Hamptons	Municipal Park	• The Hamptons Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.3 km from RK 38.5
Glastonbury	Municipal Park	• Glastonbury Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.3 km from R 40.3
Guinevere	Municipal Park	• Guinevere Park is a municipal park located in the City of Edmonton.	Unknown	Approximately 0.6 km from RK 40.5
Henry Singer	Municipal Ball Park	• Henry Singer Ball Park is a municipal ball park located in the City of Spruce Grove. The park has five baseball diamonds, all available for rent.	Unknown	Approximately 0.5 km from RK 58.2

TABLE 7.1-2 Cont'd

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
Century	Municipal Off Leash Dog Park	• Century Off-Leash Dog Park is a municipal dog park located in the City of Spruce Grove.	Unknown	Approximately 0.1 km from RK 57.2
Rotary Centennial	Municipal Park	• Rotary Centennial Park is a municipal ball park located in the City of Spruce Grove.	Unknown	Approximately 0.6 km from RK 60.5
Meridian	Municipal Sports Park	• Meridian Sports Park is a municipal sports park located in Parkland County. The park has four baseball diamonds, a soccer field, bathrooms, picnic tables and parking for 120 vehicles.	Unknown	Approximately 0.4 km from RK 65.5
Wabamun Lake	Provincial Park	• The park is characterized by rolling terrain, a result of past glaciations. The proximity of Wabamun Lake and Lake Isle make the park an ideal birding location. Recreational activities also include hiking, camping and fishing.	213.3	0.2 km from RK 96.4
RURAL ALBERTA REGION				
No Jack	Campground/ Provincial Recreation Area	• This campground offers 24 campsites for both tents and RVs. Water, fire wood, picnic tables, dry toilets and a community camp kitchen are also available.	N/A	0.2 km from RK 175.5
Yates	Natural Area	• Yates Natural Area has a diverse landscape dominated by black spruce-tamarack muskeg and several orchid species. The park is located in the Foothills-Lower Foothills Natural Region. No facilities are located onsite within the park. Recreational activities include hunting and hiking.	190.8	0.1 km from RK 222.0
Unknown	Municipal Park	• This park is located at 2nd Avenue and 42nd Street in the Town of Edson.	Unknown	Approximately 0.8 km from RK 230.6
Unknown	Municipal Park	• This park is located at 8th Avenue and 46th Street in the Town of Edson.	Unknown	Approximately 0.7 km from RK 231.3
Unknown	Municipal Park	• This park is located between 45th and 46th Streets in the Town of Edson.	Unknown	Approximately 0.5 km from RK 231.5
Kinsmen	Municipal Park	• Kinsmen Park is a municipal park located in the Town of Edson. The park offers picnic areas, a children's playground and the Kinsmen Spray Park.	Unknown	Approximately 0.7 km from RK 231.8
Unknown	Municipal Park	• This park is located at 12th Avenue and 48th Street in the Town of Edson.	Unknown	Approximately 0.5 km from RK 232.1
Hornbeck Creek	Provincial Recreation Area	• Facilities within the park include fire pits, toilets and water pumps. Recreational activities include camping and swimming.	5.3	0.6 km from RK 249.5
Obed Lake	Provincial Park	• Facilities within the park include firepits, a boat launch, fish-cleaning stations, a hand launch, pit/vault toilets and a water pump. Recreational activities available in the park include camping, canoeing/kayaking, fishing, ice fishing and power boating.	3,401.5	0.2 km from RK 278.5

TABLE 7.1-2 Cont'd

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
FRASER-FORT GEORGE/THOMPSON-NICOLA REGION				
Mount Robson	Class A Provincial Park	• Established in 1913, Mount Robson is the second oldest provincial park in BC. The park features Mount Robson, the highest peak in the Canadian Rockies, the headwaters of the Fraser River, undisturbed wilderness and recreation and tourism opportunities including camping, hiking, canoeing, caving and wildlife viewing. Mount Robson is part of the UNESCO Canadian Rocky Mountain Parks World Heritage Site. Management objectives include the use of an ecosystem-based management approach and development of a cultural interpretation program in collaboration with the Simpcw First Nation.	224,866	Approximately 1.1 km from RK 489.6
Rearguard Falls	Class A Provincial Park	• Rearguard Falls offers a viewpoint for visitors to witness Chinook salmon completing their journey from the Pacific. Recreational activities in the park include fishing, hiking, wildlife viewing and winter recreation activities including snowshoeing. A management plan is not available for the Rearguard Falls Provincial Park at this time.	48	Approximately 0.5 km from RK 498.3
Jackman Flats	Class A Provincial Park	• The park is home to rare plant communities, shifting sand dunes and an ecosystem that is unique in BC. Recreational activities within the park include hiking, cross country skiing, bird watching and plant identification. It is a Class A park, established in 2000 as the result of recommendations in the Robson Valley LRMP. In addition to rare plant communities, Jackman Flats is known as an important winter range for ungulates and as a travel corridor for deer moose and elk. The Robson Valley LRMP outlines land and resource management direction for Jackman Flats Provincial Park; including, managing the park as a non-motorized use area, minimizing disturbance by restricting hiking to designated areas, considering closure of the existing road with public input and comments from BC Parks will be considered before resource activities adjacent to protected areas are approved.	615	Approximately 0.1 km from RK 508.4
Irvins	Regional Park and Campgrounds	• Irvins Park and Campgrounds are located in the Fraser-Fort George Regional District.	Unknown	Approximately 0.1 km from RK 522
George Hicks	Regional Park	• George Hicks Regional Park is located in the Fraser-Fort George Regional District.	Unknown	Approximately 0.1 km from RK 523

TABLE 7.1-2 Cont'd

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
Pyramid Creek Falls	Class A Provincial Park	• Established in 1996 as a result of recommendations made in the Kamloops LRMP. The park was established to protect the waterfall and hanging valley as well as mixed old-growth cedar and hemlock mixed forests. No facilities or services are located within the park. Management objectives outlined in the Management Direction Statement for Pyramid Creek Falls Provincial Park include maintaining the natural qualities and conditions of the park, fostering relationships with First Nations, maintaining the visual setting of the falls for recreational and tourism values and allowing for continued casual recreation use.	13	Approximately 0.9 km from RK 585.0
Blue River Black Spruce	Class A Provincial Park	• Established in 1996 as a result of recommendations made in the Kamloops LRMP. The park was established to protect the southern portion of black spruce within the region. Ecological study opportunities are available within the area as well as river access for canoeing. No facilities or services are located within the park. Management objectives for the park include maintaining the natural qualities and conditions of the park, fostering relationships with First Nations, maintaining the visual, recreational and tourism values, allowing for continued casual recreation use and discouraging the introduction of non-native plant species.	175	Approximately 0.1 km from RK 610.7
Blue River Pine	Class A Provincial Park	• Established in 1996 as a result of recommendations made in the Kamloops LRMP. The park was established to protect wetland and upland on sandy fluvial-glacial soils along the lower portion of the Blue River as well as dry lodgepole pine forests, uncommon in the North Thompson valley. No facilities or services are located within the park. Management objectives for the park include maintaining the natural qualities and conditions of the park, fostering relationships with First Nations, maintaining visual, recreational and tourism values, allowing for continued casual recreation use and discouraging the introduction of non-native plant species.	26.4	0.4 km from RK 613.6

TABLE 7.1-2 Cont'd

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
Wire Cache	Class A Provincial Park	• The park consists of a series of old river bends in the North Thompson River. Conservation values for the park include wetland habitat with old-grown cottonwood, spruce and cedar. No facilities or services are located within the park. Recreational activities in the park include canoeing, fishing, hunting, wildlife viewing and winter recreation. A management plan is not available for Wire Cache Provincial Park at this time.	50	Approximately 0.5 km from RK 662.7
Eakin Creek Canyon	Class A Provincial Park	• Includes a narrow rock canyon with steep walls, natural tunnels, and rock outcrops, and an 8 m waterfall. The park is accessed by gravel road off Highway 24, 5 km west of Little Fort. There are no developed trails and no facilities in the park. The park offers hiking, wildlife viewing, nature study, fishing, hunting, snowshoeing, and cross country skiing opportunities. The park was established in 1996 as a result of recommendations made in the Kamloops LRMP. Park values include conservation, recreation and tourism and cultural heritage, specifically the remnants of old placer gold mining operations (sluice box).	10	Approximately 0.2 km from RK 752.4
North Thompson Islands	Class A Provincial Park	• Established in 1996, the park contains remnants of Hudson Bay Company trail, as well as undisturbed floodplain islands. No facilities are provided in the park. Recreational activities include canoeing, fishing, hunting and wildlife viewing.	78.6	Approximately 0.5 km from RK 762.3
Chu Chua Cottonwood	Class A Provincial Park	• Protects typical, undisturbed floodplain islands in the North Thompson River lowlands. The park is accessed only by boat. There are no camping or day-use facilities provided. Recreational opportunities include wildlife viewing, boating, hunting, and fishing. Snowshoeing is permitted, but there are no designated trails. The park was established in 1996 as a result of recommendations made in the Kamloops LRMP. Park values include conservation, recreation and tourism and cultural heritage.	100	Approximately 0.1 km from RK 765.3
North Thompson Oxbows Jensen Island	Class A Provincial Park	• Established in 1996 from recommendations made in the Kamloops LRMP. • It consists of an oxbow feature that provides seasonal riparian habitats.	30	Approximately 0.5 km from RK 822.7
McQueen Creek	Ecological Reserve	• Established in 1982 to protect vegetation typical of the Middle Grassland in interior BC.	34	Approximately 0.2 km from RK 829.3
Westsyde Centennial	Municipal Park	• Westsyde Centennial Park is a neighbourhood park in the City of Kamloops.	Unknown	Approximately 0.9 km from RK 838.0

TABLE 7.1-2 Cont'd

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
Rivers Trail	Municipal Park	• Rivers Trail Park is a linear municipal park in the Westsyde neighbourhood of the City of Kamloops.	Unknown	Approximately 0.6 km from RK 839.1
Crestline	Municipal Park	• Crestline Park is a neighbourhood park in the City of Kamloops.	Unknown	Approximately 0.2 km from RK 846.2
Pineview Valley	Municipal Park	• Pineview Valley Park is a linear municipal park in the City of Kamloops.	Unknown	Approximately 0.4 km from RK 852
Coldwater River	Class A Provincial Park	• Established in 1986 to protect portions of the Coldwater River valley ecosystem and for outdoor recreation activities.	Unknown	0.1 km from RK 980.1
FRASER VALLEY REGION				
Coquihalla River	Class A Provincial Park	• Established in 1986 to provide recreation and rest stop opportunities to travellers on the Coquihalla Highway.	103	0.1 km from RK 1025.4
Coquihalla Canyon	Class A Provincial Park	• Established in 1986 and contains the Othello Tunnels, built for the old Kettle Valley Railway.	159	0.2 km from RK 1039
Kawkawa Lake	Municipal Park	• Kawkawa Lake Park is a former provincial park; currently a municipal park in the District of Hope.	Unknown	Approximately 0.1 km from RK 1041.6
Glenhalla	Municipal Park	• Glenhalla Park is a municipal park in the District of Hope.	Unknown	Approximately 0.3 km from RK 1042.9
Thacker	Regional Park	• Thacker Park is a FVRD regional park located in the District of Hope. The park offers viewing opportunities of spawning and rearing channels for various salmon species.	11	Approximately 0.8 km from RK 1043
Bridal Veil Falls	Class A Provincial Park	• Established in 1965 to conserve scenic values, and offers day-use recreational opportunities such as hiking and viewing the falls.	32	0.5 km from RK 1079.6
Sardis	Municipal Park	• Sardis Park is a municipal park located in the City of Chilliwack. The park features a trail, pond and play area.	5	Approximately 0.6 km from RK 1096.3
Watson Glen	Municipal Park	• Watson Glen Park is a municipal park located in the City of Chilliwack. The park includes a walking trail, playground area and other recreation features.	11.1	Approximately 0.5 km from RK 1099.1
Great Blue Heron	Municipal Nature Reserve	• The Great Blue Heron Nature Reserve is located in the City of Chilliwack. The nature reserve features an interpretive centre for a breeding colony of great blue herons. The Great Blue Heron Nature Reserve Society manages the reserve.	130	Approximately 0.9 km from RK 1104
Callaghan	Municipal Park	• Callaghan Park is a municipal park located in the City of Abbotsford.	Unknown	Approximately 0.5 km from RK 1118.3
Clayburn Creek	Municipal Park	• Clayburn Creek Park features a 2.6 km streamside trail in the City of Abbotsford.	Unknown	RK 1118.5 to RK 1118.8
McKinley	Municipal Park	• McKinley Park is a municipal park in the City of Abbotsford with sports courts.	Unknown	Approximately 0.4 km from RK 1119.9
Sandy Hill	Municipal Park	• Sandy Hill Park is a municipal park in the City of Abbotsford.	Unknown	Approximately 0.3 km from RK 1120.4
Kootenay	Municipal Park	• Kootenay Park is a municipal park in the City of Abbotsford.	Unknown	Approximately 0.5 km from RK 1121.3

TABLE 7.1-2 Cont'd

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
Stoney Creek	Municipal Park	• Stoney Creek Park is a municipal park in the City of Abbotsford.	Unknown	Approximately 0.4 km from RK 1121.8
Bateman	Municipal Park	• Bateman Park is a municipal park in the City of Abbotsford with soccer fields.	Unknown	Approximately 0.4 km from RK 1121.8
Douglas Taylor	Municipal Park	• Douglas Taylor Park is a municipal park in the City of Abbotsford.	Unknown	Approximately 0.1 km from RK 1130.4
METRO VANCOUVER REGION				
Topham	Municipal Park	• Topham Park is a municipal park located in the Township of Langley. Amenities include sports fields, a playground and trails.	Unknown	Approximately 0.8 km from RK 1151.7
Telegraph Trail	Municipal Park	• Telegraph Trail is a municipal park located in the Township of Langley. Amenities include sports fields, a playground and trails.	Unknown	Approximately 0.7 km from RK 1152.6
West Langley	Municipal Park	• West Langley is a municipal park located in the Township of Langley. Amenities include sports fields, a playground and trails.	Unknown	Approximately 0.8 km from RK 1153.3
Greenbelt (27C)	Municipal Natural Area	• Greenbelts are natural linear areas in the City of Surrey designed to connect parks and open spaces.	Unknown	Approximately 0.1 km from RK 1159
Barnston	Municipal Park	• Barnston Park is a municipal park in the City of Surrey with a nature area protecting two sensitive creeks and an open field.	3	Approximately 0.1 km from RK 1159.6
Greenbelt (27E)	Municipal Natural Area	• Greenbelts are natural linear areas in the City of Surrey designed to connect parks and open spaces.	Unknown	Approximately 0.1 km from RK 1159.6
Greenbelt (26C)	Municipal Natural Area	• Greenbelts are natural linear areas in the City of Surrey designed to connect parks and open spaces.	Unknown	Approximately 0.2 km from RK 1160.7
Abbey Glen	Municipal Park	• Abbey Glen is a municipal park in the City of Surrey and consists of an open green space and natural forested area.	Unknown	Approximately 0.6 km from RK 1161.2
Greenbelt (16A/B)	Municipal Natural Area	• Greenbelts are natural linear areas in the City of Surrey designed to connect parks and open spaces.	Unknown	Approximately 0.4 km from RK 1161.6
J.R. Douglas	Municipal Park	• J.R. Douglas Park is a municipal park located in the City of Surrey. It includes forested areas, trails, open space and a playground.	Unknown	Approximately 0.8 km from RK 1163.1
Greenbelt (15M)	Municipal Natural Area	• Greenbelts are natural linear areas in the City of Surrey designed to connect parks and open spaces.	Unknown	Approximately 0.3 km from RK 1163.2
North Slope	Municipal Park	• North Slope Park is a municipal park located in the City of Surrey. The park includes a wooded natural area and is intended as a conservation area.	Unknown	Approximately 0.1 km from RK 1164
Fraser View	Municipal Park	• Fraser View Park is a municipal park located in the City of Surrey. It contains open meadows and forest groves.	6.5	Approximately 0.1 km from RK 1164.6
Community (4F)	Municipal Park	• Community 4F Park is a municipal park located in the City of Surrey.	3.1	Approximately 0.1 km from RK 1165.2
Northview	Municipal Park	• Northview Park is a municipal park located in the City of Surrey. It contains a trail and playground.	Unknown	Approximately 0.8 km from RK 1165.4

TABLE 7.1-2 Cont'd

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
Greenbelt (4E)	Municipal Natural Area	• Greenbelts are natural linear areas in the City of Surrey designed to connect parks and open spaces.	Unknown	Approximately 0.7 km from RK 1165.9
Robin	Municipal Park	• Robin Park is a municipal park located in the City of Surrey. It includes a multi-use grass field and a forest grove.	Unknown	Approximately 0.7 km from RK 1166.4
Greenbelt (3B)	Municipal Natural Area	• Greenbelts are natural linear areas in the City of Surrey designed to connect parks and open spaces.	Unknown	Approximately 0.5 km from RK 1166.9
Invergarry	Municipal Park	• Invergarry Park is a municipal park located in the City of Surrey and contains natural forest and riparian creek habitat. The park includes a mountain bike park.	37.5	Approximately 0.1 km from RK 1167.6
Victoria	Municipal Park	• Victoria Park is a municipal park located in the City of Surrey.	Unknown	Approximately 0.1 km from RK 1167.9
Mackin	Municipal Park	• Mackin Park is a municipal park located in the City of Coquitlam. The park includes sports and recreation amenities.	Unknown	Approximately 0.3 km from RK 1172.5
Burns	Municipal Park	• Burns Park is a municipal park located in the City of Coquitlam. It consists of a playground and spray park.	Unknown	Approximately 0.4 km from RK 1174
Hume	Municipal Park	• Hume Park is a municipal park located in the City of New Westminster. Facilities include sports fields, open spaces, a dog area, playgrounds and an outdoor pool.	Unknown	Approximately 0.7 km from RK 1174.2
Lower Lougheed	Municipal Park	• Lower Lougheed Park is a municipal park located in the City of Coquitlam. Amenities include a playground and sports courts.	Unknown	Approximately 0.2 km from RK 1174.3
Guilby	Municipal Park	• Guilby Park is a municipal park located in the City of Coquitlam that includes a playground.	Unknown	Approximately 0.1 km from RK 1174.5
Brookmere	Municipal Park	• Brookmere Park is a municipal park located in the City of Coquitlam that includes baseball fields.	Unknown	Approximately 0.5 km from RK 1175.2
Keswick	Municipal Neighbourhood Park	• Keswick Park is a municipal park located in the City of Burnaby and includes a playground.	3.3	Approximately 0.1 km from RK 1175.7
Lyndhurst	Municipal Neighbourhood Park	• Lyndhurst Park is a municipal park located in the City of Burnaby.	1.8	Approximately 0.8 km from RK 1176.1
Cameron	Municipal Neighbourhood Park	• Cameron Park is a municipal park located in the City of Burnaby that includes a playground.	6.1	Approximately 0.3 km from RK 1176.2
Bell	Municipal Neighbourhood Park	• Bell Park is a municipal park located in the City of Burnaby.	2.0	Approximately 0.1 km from RK 1176.4
Stoney Creek	Municipal Park	• Stoney Creek is a municipal park located in the City of Burnaby with important wildlife values. The park includes a trail system, playground and sports field.	7.6	Approximately 0.5 km from RK 1176.4
Eastlake	Municipal Neighbourhood Park	• Eastlake Park is a municipal park located in the City of Burnaby.	0.7	Approximately 0.1 km from RK 1176.6

TABLE 7.1-2 Cont'd

Name	Designation	Overview of Purpose/Goal	Size (ha)	RK Range[1]
Simon Fraser Hills	Municipal Neighbourhood Park	• Simon Fraser Hills Park is a municipal park located in the City of Burnaby.	1.8	Approximately 0.7 km from RK 1176.6
Burnaby Lake	Regional Nature Park	• Burnaby Lake Regional Nature Park is located in the City of Burnaby. The lake provides recreational opportunities such as rowing. The park is a regional wildlife sanctuary.	317.9	Approximately 0.4 km from RK 1177
Charles Rummel	Municipal Neighbourhood Park	• Charles Rummel Park is a municipal park located in the City of Burnaby. The park includes a playground and spray park.	8.3	Approximately 0.6 km from RK 1178
Eagle Creek	Municipal Ravine Park	• Eagle Creek Ravine Park is a municipal park located in the City of Burnaby.	7.2	Approximately 0.1 km from RK 1178.9
Burnaby 200	Municipal Conservation Area	• Burnaby 200 is a municipal conservation area in the City of Burnaby.	23.9	Approximately 0.5 km from RK 1178.9
Squint Lake	Municipal Neighbourhood Park	• Squint Lake Park is a municipal park located in the City of Burnaby. It includes walking trails, a playground and sports facilities.	10.7	Approximately 0.2 km from RK 1179.9
Glen Abbey Creek	Municipal Ravine Park	• Glen Abbey Creek Ravine is a municipal park located in the City of Burnaby.	0.4	Approximately 0.4 km from RK 1180
Duthie Union	Municipal Neighbourhood Park	• Duthie Union Park is a municipal park located in the City of Burnaby.	4.1	Approximately 0.1 km from RK 1

Sources: ATPR 2012, BC Integrated Land Management Bureau (ILMB) 1999, BC Parks 2013a, BC Parks 2013b, CHRS 2013, City of Abbotsford 2013, City of Burnaby 1998, City of Burnaby 2013, City of Chilliwack 2013, City of Coquitlam 2013, City of Edmonton 2013a, City of Kamloops 2013, City of New Westminster 2013, , City of Spruce Grove 2013, City of Surrey 2010, City of Surrey 2013, FVRD 2008, Parkland County 2013, Tourism Burnaby 2013, Township of Langley 2013, Vyse and Clarke 2000

Notes: 1 Locations are approximate.

Trans Mountain has initiated the consultation and investigation process with BC Parks regarding Project activities within BC parks and protected areas, including requests for boundary adjustments required for temporary construction activity in Finn Creek Provincial Park, North Thompson River Provincial Park, and the Lac du Bois Grasslands Protected Area. Trans Mountain has also initiated investigations regarding the use of temporary workspace adjacent to the existing TMPL right-of-way in Bridal Veil Falls Provincial Park (however, the proposed pipeline corridor subject to this assessment does not cross this park). At the time of writing, Trans Mountain received direction from the Executive Director, Parks, Planning and Management Branch, BC Parks, that the Minister of Environment determined the proposal for Finn Creek Provincial Park, North Thompson River Provincial Park, Lac du Bois Grasslands Protected Area and Bridal Veil Falls Provincial Park should be further considered as a Stage 2 boundary adjustment. The Minister directed that a boundary adjustment is not required for the pipeline segment through Coquihalla Summit Recreation Area but determined a full impact assessment should be completed for the Project in the recreation area. As the Project progresses, Trans Mountain will continue its consultation, and parallel assessment and permitting process, with BC Parks and other regulatory authorities pertaining to proposed works in provincial parks and protected areas.

7.1.1 Parks and Protected Areas – Edmonton Region

Figure 7.1-1 demonstrates the locations of parks and protected areas found in the RSA of the Edmonton Region.

Site-specific management plans are not available for each park within the Edmonton Region. A framework for parks within this region is outlined within the Alberta Plan for Parks 2009–2019 (ATPR 2009), created in alignment with the Government of Alberta's Land Use Framework (Government of Alberta 2008). The vision for Alberta parks is to "inspire people to discover, value, protect and enjoy the natural world and the benefits it provides for current and future generations" (ATPR 2009).

In the Edmonton Region, the proposed pipeline corridor and HORU LSA do not encounter lands under Parks Canada jurisdiction, Migratory Bird Sanctuary, World Biosphere Reserve, Ramsar Wetlands, World Heritage Site or Ducks Unlimited Canada (DUC) projects (DUC 2012a, Environment Canada 2012, Ramsar Convention on Wetlands 2012, United Nations Educational, Scientific and Cultural Organization [UNESCO] World Heritage Convention 2012, UNESCO 2012).

No provincial parks or protected areas are directly crossed by the proposed pipeline corridor in the Edmonton Region. However, three municipal parks within the City of Edmonton are crossed: Menisa Municipal Park (approximately RK 20.0 to RK 20.5); Richford Municipal Park (approximately RK 24.5 to RK 24.7); and Granville Municipal Park (approximately RK 42.8 to RK 43), described in Table 7.1-1 There are 2 provincial parks, 15 municipal parks, 1 nature reserve, 2 municipal sports parks, 1 municipal ball park and 1 municipal off-leash dog park located in the HORU LSA in this region, described in Table 7.1-2. The closest provincial park is Wabamun Lake Provincial Park; the proposed pipeline corridor is located about 200–300 m north of the park from approximately RK 95 to RK 97 (Village of Wabamun 2010).

There are a range of parks and protected areas in the HORU RSA (Table B-1 in Appendix B). These are not located within the proposed pipeline corridor; however, access to these areas is available via roads crossed by the proposed pipeline corridor and utilized by the Project. Overall, there are 6 provincial parks, 1 national park, 54 natural areas and 5 provincial recreation areas in the HORU RSA in this region. Additionally, there is one Important Bird Area located in the HORU RSA of the Edmonton Region (Important Bird Areas Canada 2013). Each protected area was established with specific management objectives, to conserve environmental, scenic and recreational values.

There are a number of land use and management plans relevant to the Region that pertain to parks and protected areas. According to the Parkland County MDP, the proposed pipeline corridor crosses over three areas zoned as environmentally significant (approximately RK 64, RK 81, RK 126). The MDP further describes these as regionally significant areas, and plans to protect environmentally significant areas from inappropriate development (Parkland County 2007). The Parkland County Recreation Plan stresses the importance (culturally and environmentally) of the river valleys found within Parkland County (crossed by the proposed pipeline corridor at RK 33.5), and therefore, must be protected through careful planning of any proposed development. The county aims to continue expanding its park and open space system by acquiring new parcels of land (which must be more than 2.0 ha) (RC Strategies 2009). This plan does not specify any restrictions or considerations pertaining to pipeline construction within areas zoned as Environmentally Significant.

The proposed pipeline corridor crosses through several areas zoned as parks, open spaces, or natural areas in the Town of Stony Plain (approximately RK 62, RK 63, RK 64, RK 65 and RK 67). The Stony Plain MDP promotes linkages between these natural areas and other parks within the city (Armin A. Preiksaitis & Associates 2005). This plan does not specify any restrictions or considerations pertaining to pipeline construction within areas zoned as parks, open spaces, or natural areas.

According to the Spruce Grove MDP, the proposed pipeline corridor crosses through five areas zoned as open space (at approximately RK 58, RK 60, RK 62, RK 63 and RK 64). Of these five areas, two are identified as existing Stormwater Management Facilities (RK 58 and RK 60), one is a proposed park (RK 63) and the largest one is identified as an environmentally significant area (RK 60). The Spruce Grove MDP further describes this environmentally significant area (Area F) as containing a mix of upland forest and wetlands, which could act as a wildlife corridor between other areas of the city. The Spruce Grove MDP requires an assessment for any proposed development within these areas. The assessment should include a description of the development and potential effects, mitigation measures, and the viability and sustainability of the natural area (City of Spruce Grove 2010). This plan does not specify any

restrictions or considerations pertaining to pipeline construction within areas zoned as environmentally significant.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to parks and protected areas in the Edmonton Region.

- Concern regarding the preservation of parkland areas in the City of Edmonton was identified at the Edmonton East Community Workshop.

7.1.2 Parks and Protected Areas – Rural Alberta Region

Figure 7.1-2 demonstrates the locations of parks and protected areas found in the RSA of the Rural Alberta Region.

Site-specific management plans are not available for each park within the Rural Alberta Region. A framework for parks within this section is outlined within the Alberta Plan for Parks 2009–2019 (ATPR 2009), created in alignment with the Government of Alberta's Land Use Framework (Government of Alberta 2008).

In the Rural Alberta Region, the proposed pipeline corridor, proposed facilities and the HORU LSA do not encounter lands under Parks Canada jurisdiction, Migratory Bird Sanctuary, World Biosphere Reserve, Ramsar Wetlands, World Heritage Site or DUC projects (DUC 2012a, Environment Canada 2012, Ramsar Convention on Wetlands 2012, UNESCO 2012, UNESCO World Heritage Convention 2012).

There are no known provincial or municipal parks or protected areas crossed by the proposed pipeline corridor in the Rural Alberta Region, described in Table 7.1-1 There is one provincial park (Obed Lake Provincial Park), one natural area, two provincial recreation areas and five municipal parks located in the HORU LSA in this region, described in Table 7.1-2.

There are a range of parks and protected areas in the HORU RSA (Table B-1 in Appendix B). These are not located within the proposed pipeline corridor; however, access to these areas is available via roads crossed by the proposed pipeline corridor and utilized by the Project. Overall, there are 1 national park, 6 provincial parks (with 1 Special Management Zone), 14 natural areas, 2 wildland provincial parks, 33 provincial recreation areas, 1 wilderness area, 1 ecological reserve, 1 wilderness park and 4 wildland provincial parks in the HORU RSA in this region. Each protected area was established with specific management objectives, to conserve environmental, scenic and recreational values.

There are a number of land use and management plans relevant to the region that pertain to parks and protected areas. The Yellowhead County plans on developing a Recreation Master Plan to guide management of and investment in parks, open spaces and trails (Yellowhead County 2006). According to the Edson MDP, the proposed pipeline corridor crosses through an area zoned as existing schools, parks and public open spaces at approximately RK 229 (Vision Park) (Town of Edson 2006). This plan does not specify any restrictions or considerations pertaining to pipeline construction within areas zoned as existing schools, parks and public open spaces. The proposed pipeline corridor crosses along an area zoned as neighbourhood and district open space as per the Hinton Parks Master Plan. The Hinton Parks Master Plan defines open space as all undeveloped and developed reserve land, rights-of-way, Environmental Reserves, buffers, boulevards, trails, natural areas and utility lots. The Hinton Parks Master Plan indicates that these areas will serve aesthetic and buffering functions for nearby transportation and utility rights-of-way (ISL Infrastructure Systems 2003). This plan does not specify any restrictions or considerations pertaining to pipeline construction within areas zoned as neighbourhood and district open space.

The proposed pipeline corridor crosses an area zoned as open space – passive recreation/environment along the southern border of the town. The Hinton MDP describes the need for passive recreation areas for amenity, aesthetics and activities such as walking and picnicking (Town of Hinton 1998). This plan

does not specify any restrictions or considerations pertaining to pipeline construction within areas zoned as open space – passive recreation/environment.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), no issues were identified with respect to parks and protected areas in the Rural Alberta Region.

7.1.3 Parks and Protected Areas – Jasper National Park Region

Figure 7.1-3 demonstrates the locations of parks and protected areas found in the Jasper National Park Region.

In the Jasper National Park Region, all lands are designated under Parks Canada jurisdiction. Project activities within the Jasper National Park Region are confined to the existing station boundaries at the Jasper Pump Station as well as reactivation activities along the Hinton to Hargreaves segment of the existing Trans Mountain pipeline. Jasper National Park is a designated World Heritage Park as part of Canada's Rocky Mountain Parks (UNESCO World Heritage Convention 2012). In the Jasper National Park Region, the Footprint of the Jasper Pump Station, the existing TMPL right-of-way, HORU LSA and HORU RSA do not encounter lands designated as a Migratory Bird Sanctuary, World Biosphere Reserve, Ramsar Wetlands, or DUC projects (DUC 2012a, Environment Canada 2012, Ramsar Convention on Wetlands 2012, UNESCO 2012).

7.1.4 Parks and Protected Areas – Fraser-Fort George/Thompson-Nicola Region

Figure 7.1-4 demonstrates the locations of parks and protected areas found in the Fraser-Fort George/Thompson-Nicola Region.

In the Fraser-Fort George/Thompson-Nicola Region, the proposed pipeline corridor, proposed facilities and the HORU LSA do not encounter lands under Parks Canada jurisdiction, Migratory Bird Sanctuary, World Biosphere Reserve, Ramsar Wetlands, World Heritage Site or DUC projects (DUC 2012b, Environment Canada 2012, Ramsar Convention on Wetlands 2012, UNESCO 2012, UNESCO World Heritage Convention 2012).

The proposed pipeline corridor crosses three provincial parks or protected areas in this region: Finn Creek Provincial Park (approximately RK 638.7 to RK 639.3); North Thompson River Provincial Park (approximately RK 725.5 to RK 725.9); and Lac du Bois Grasslands Protected Area (approximately RK 829.0 to RK 836.9), described in Table 7.1-1 Each protected area was established with specific management objectives, to conserve environmental, scenic and recreational values. The proposed pipeline corridor also crosses two municipal parks in this region: Ord Road Municipal Park in the City of Kamloops (approximately RK 844.8 to RK 844.9), and Kenna Cartwright Municipal Park in the City of Kamloops (approximately RK 848.4 to RK 850.0). There are 12 Class A provincial parks, 1 ecological reserve, 2 regional parks, and 1 municipal park located in the HORU LSA in this region, described in Table 7.1-2 described in Table 7.1-2. Each protected area was established with specific management objectives, to conserve environmental, scenic and recreational values.

There are a range of parks and protected areas in the HORU RSA (Table B-2 in Appendix B). These are not located within the proposed pipeline corridor; however, access to these areas is available via roads crossed by the proposed pipeline corridor and utilized by the Project. Overall, there 75 Class A provincial parks, 1 conservancy, 7 ecological reserves, 13 protected areas, 2 wildlife management areas and 1 recreation area in the HORU RSA in this region. Each protected area was established with specific management objectives, to conserve environmental, scenic and recreational values.

There are a number of land use and management plans relevant to the region that pertain to parks and protected areas. The proposed pipeline corridor crosses through two areas zoned as public development/institutional at approximately RK 519 and RK 522. The Fraser-Fort George Regional District Robson Valley-Canoe Upstream OCP describes this zone as an area for community-related uses such as recreation areas, parks, public open spaces, treatment sites or school sites (RDFFG 2006). This plan does not specify any restrictions or considerations pertaining to pipeline construction within areas zoned

as public development/institutional. The TNRD RGS notes its objective to create an open space planning system and to work with communities to create more parks, recreation sites and open space facilities (TNRD 2000). This plan does not specify any restrictions or considerations pertaining to pipeline construction.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to parks and protected areas in the Fraser-Fort George/Thompson-Nicola Region.

- Residents in the Kamloops area have a strong connection with the Lac du Bois Grasslands Protected Area (Williams, Lishman pers. comm.). BC MFLNRO highlighted the importance of minimizing disturbances and successful restoration with the use of native grasses (Reudink, Lishman pers. comm.).

- Concerns regarding increased access to sensitive areas and issues related to enforcement were raised at the Kamloops Community Workshop.

- At the Blue River Community Workshop, it was noted that there is a community park behind the houses on Cedar Street. The proposed pipeline corridor parallels Cedar Street in the community of Blue River.

- It was noted that the Finn Creek snowmobile parking lot is used year round at the Blue River Community Workshop.

- Concerns regarding potential impacts to North Thompson Provincial Park were identified at the Clearwater Community Workshop. Recreational use in the park includes cross-country skiing, biking and horseback riding.

7.1.5 Parks and Protected Areas – Fraser Valley Region

Figure 7.1-5 demonstrates the locations of parks and protected areas found in the Fraser Valley Region.

In the Fraser Valley Region, the proposed pipeline corridor and HORU LSA do not encounter lands under Parks Canada jurisdiction, Migratory Bird Sanctuary, World Biosphere Reserve, Ramsar Wetlands, World Heritage Site or DUC projects (DUC 2012b, Environment Canada 2012, Ramsar Convention on Wetlands 2012, UNESCO 2012, UNESCO World Heritage Convention 2012).

The proposed pipeline corridor crosses two provincial parks or protected areas in this region: Coquihalla Summit Recreation Area (approximately RK 992.4 to RK 1005.2) and F.H Barber Provincial Park (RK 1062.8 to RK 1062.8), described in Table 7.1-1. Although a very small portion of F.H. Barber Provincial Park is crossed by the proposed pipeline corridor, Trans Mountain does not plan to construct through it. The proposed pipeline corridor also crosses Cheam Lake Wetlands Regional Park in Electoral Area D (approximately RK 1080.1to RK 1080.4) and Straiton Municipal Park in the City of Abbotsford (approximately RK 1119.7 to RK 1120.3). There are 3 provincial parks, 1 regional park, 1 municipal nature reserve and 12 municipal parks located in the HORU LSA in this region, described in Table 7.1-2. Each protected area was established with specific management objectives to conserve environmental, scenic and recreational values.

There are a number of land use and management plans relevant to the Region that pertain to parks and protected areas. Within the urban area of Abbotsford, the proposed pipeline corridor crosses areas zoned as city parks and open space at approximately RK 1118.6 and RK 1120.6, and crosses a proposed park space at approximately RK 1117.6 (City of Abbotsford 2005). In the rural area of Abbotsford, the proposed pipeline corridor crosses a city parks and open space area at approximately RK 1130.6 (City of Abbotsford 2005).

There are a range of parks and protected areas in the HORU RSA (Table B-2 in Appendix B). These are not located within the proposed pipeline corridor; however, access to these areas is available via roads

crossed by the proposed pipeline corridor and utilized by the Project. For example, access to Cultus Lake Provincial Park (located in the HORU RSA) is crossed by the proposed pipeline corridor. Overall, there are 15 Class A provincial parks, 1 Class C provincial park, 10 ecological reserves, 1 wildlife management area, 2 protected areas and 1 Canadian Heritage River in the HORU RSA in this region. Each protected area was established with specific management objectives, to conserve environmental, scenic and recreational values.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to parks and protected areas in the Fraser Valley Region.

- Othello Road, which requires upgrading if it is to handle large equipment, is the access road to Coquihalla Canyon Provincial Park, which includes the Othello Tunnels (Misumi pers. comm.).

7.1.6 Parks and Protected Areas – Metro Vancouver Region

Figure 7.1-6 demonstrates the locations of parks and protected areas found in the Metro Vancouver Region.

In the Metro Vancouver Region, the proposed pipeline corridor and HORU LSA do not encounter lands under Parks Canada jurisdiction, Migratory Bird Sanctuary, World Biosphere Reserve, Ramsar Wetlands, World Heritage Site or DUC projects (DUC 2012b, Environment Canada 2012, Ramsar Convention on Wetlands 2012, UNESCO 2012, UNESCO World Heritage Convention 2012).

The proposed pipeline corridor directly crosses the Surrey Bend Regional Park (approximately RK 1160.5 to RK 1163.7), Burnaby Mountain Municipal Conservation Area (approximately RK 1180.3 to RK 1181); Westridge Municipal Neighbourhood Park (approximately RK 1181.6 to RK 1181.8); and Brunette River Municipal Conservation Area in the City of Burnaby (approximately 1176.6), as well as several other municipal parks, described in Table 7.1-1. At the Surrey Community Workshop, it was noted that there is a restricted covenant on land within Surrey Bend Regional Park, and that permission for work is needed from the province.

There is 1 municipal conservation area, 7 municipal natural areas, 30 municipal and municipal neighbourhood parks and 1 regional nature park located in the HORU LSA in this region, described in Table 7.1-2. Each protected area was established with specific management objectives to conserve environmental, scenic and recreational values. There are a range of parks and protected areas in the HORU RSA (Table B-2 in Appendix B). While these are not located within the pipeline corridor, access to these areas is available via roads that may be crossed by the proposed pipeline corridor and utilized by the Project. Overall, there are 6 Class A provincial parks, 1 ecological reserve and 7 wildlife management areas in the HORU RSA in this region. Additionally, there are 2 national wildlife areas, a national historic site of Canada, a DUC project, a Ramsar wetland site and a migratory bird sanctuary in the HORU RSA. Each protected area was established with specific management objectives, to conserve environmental, scenic and recreational values.

There are a number of land use and management plans relevant to the region that pertain to parks and protected areas. The proposed pipeline corridor crosses several Conservation and Recreational Areas in Burnaby, Coquitlam and Surrey. The Metro Vancouver RGS describes the Metro Vancouver Regional Parks and Greenways Plan as a way to protect and improve Conservation and Recreational Areas and to create buffers along these areas to protect them from other nearby activities. The Metro Vancouver RGS also notes that utility companies should avoid fragmentation of these areas and, where fragmentation is unavoidable, should consider mitigation measures (Metro Vancouver 2010a).

The Metro Vancouver RGS further outlines plans to develop the Metro Vancouver Regional Recreational Greenway Network, which are connections and corridors between Conservation and Recreational Areas within the region (for both recreational and conservation purposes). Although the proposed pipeline corridor crosses these connections, the network is currently conceptional (Metro Vancouver 2010a).

According to the Southwest Coquitlam and the Waterfront Village Neighbourhood Plans in the City of Coquitlam, the proposed pipeline corridor crosses two areas zoned as parks, open spaces, or natural areas at approximately RK 1171.6 (City of Coquitlam 2001). This plan does not specify any restrictions or considerations pertaining to pipeline construction within areas zoned as parks/open spaces/natural areas.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to parks and protected areas in the Metro Vancouver Region.

- Bon Accord Creek, located in the City of Surrey, is of substantial Aboriginal interest; Aboriginal communities are trying to re-establish the fish passage (Baron pers. comm.). Bon Accord Creek is crossed by the proposed pipeline corridor from RK 1168.6 to RK 1169.6.

- Provincial and community parks, including their recreational values, were identified as a concern at the Surrey ESA Workshop.

- Concerns regarding disruption to new access of Surrey Bend Regional Park were identified at the Surrey Community Workshop.

- At the Burnaby Community Workshop, concern was raised regarding access to parks. Access should be controlled to maintain environmental values of parks.

7.2 Indian Reserves, Métis Settlements and Asserted Traditional Territories

This subsection discusses IRs and Métis Settlements along the proposed pipeline corridor and in the Socio-Economic RSA within each Socio-Economic Region, as well as the asserted Aboriginal traditional territories potentially affected by the Project.

Overall, there are 10 IRs crossed by the proposed pipeline corridor. Less than one percent (approximately 0.3%) of the land tracts in the proposed pipeline corridor is Aboriginal (IR land). On a regional scale, the Socio-Economic RSA, as opposed to the HORU RSA, was used for the identification of IRs and Métis Settlements, as the focus is on communities located in proximity to the Project such that they may be a source of labour or services. Table 7.2-1 summarizes the number of IRs in each of the regions of the Socio-Economic RSA.

Sixty-two Aboriginal communities have been identified as potentially affected by the Project. Key traditional land uses practices by Aboriginal peoples, which may extend to areas throughout the Socio-Economic RSA and HORU RSA, include hunting, fishing, trapping, gathering (food and medicinal plants, plants used for traditional crafts) and the ceremonial use or maintenance of spiritual sites. These traditional practices are carried out today for both cultural and subsistence/livelihood purposes in many areas. Further detail on traditional land and resource use activities and areas is discussed in the Traditional Land and Resource Use Technical Report of Volume 5D.

A summary of Trans Mountain's engagement activities with potentially affected Aboriginal communities is provided in Volume 3B.

TABLE 7.2-1

NUMBER OF INDIAN RESERVES IN THE SOCIO-ECONOMIC REGIONAL STUDY AREA

Socio-Economic Region	IRs Crossed by the Proposed Pipeline Corridor	Number of Aboriginal Communities Identified as Potentially Affected by the Project[1]	Number of IRs in the Socio-Economic RSA (not all are populated)	Number of IRs in the Socio-Economic RSA belonging to Aboriginal Communities Identified as Potentially Affected by the Project	Number of IRs in the Socio-Economic RSA belonging to Aboriginal Communities not Identified as Potentially Affected by the Project
Edmonton Region	0	9	6	6	0
Rural Alberta Region	0	5	3	3	0
Jasper National Park Region	0	1	0	0	0
Fraser-Fort George/ Thompson-Nicola Region	3	15	49	41	8
Fraser Valley Region	7	23	88	77	11
Metro Vancouver Region	0	9	21	18	3

Notes: 1 Asserted traditional territories of Aboriginal communities may extend into more than one socio-economic region. For the purposes of analysis, however, each Aboriginal community was located in one socio-economic region only.

7.2.1 Indian Reserves, Métis Settlements and Asserted Traditional Territories – Edmonton Region

No IRs or Métis Settlements are crossed by the proposed pipeline corridor in the Edmonton Region. Nine Aboriginal communities in the Edmonton Region have been identified as potentially affected by the Project in terms of traditional use areas, and these Aboriginal communities have six IRs located in the Socio-Economic RSA of the Edmonton Region. More detailed overviews of these Aboriginal communities and IRs are found in Section 5.1.

7.2.2 Indian Reserves, Métis Settlements and Asserted Traditional Territories – Rural Alberta Region

No IRs or Métis Settlements are crossed by the proposed pipeline corridor in the Rural Alberta Region. Five Aboriginal communities in the Rural Alberta Region have been identified as potentially affected by the Project in terms of traditional use areas, and these communities have three IRs located in the Socio-Economic RSA of the Rural Alberta Region. More detailed overviews of these Aboriginal communities and IRs are found in Section 5.2.

7.2.3 Indian Reserves, Métis Settlements and Asserted Traditional Territories – Jasper National Park Region

No IRs or Métis Settlements are crossed by the Jasper Pump Station or the reactivated pipeline segment in the Jasper National Park Region. One Aboriginal community in the region has been identified as potentially affected by the Project in terms of traditional use areas, but this community does not have any IRs located in the Socio-Economic RSA of the Jasper National Park Region. An overview of this Aboriginal community is found in Section 5.3.

The Jasper National Park Management Plan identifies strengthening Aboriginal relationships as a key strategy. This strategy includes fostering strong working relationships, encouraging participation in the management of the park, fostering reconciliation and incorporating Aboriginal content into the visitor experience (Parks Canada 2010).

7.2.4 Indian Reserves, Métis Settlements and Asserted Traditional Territories – Fraser-Fort George/Thompson-Nicola Region

The proposed pipeline corridor crosses three IRs within the Fraser-Fort George/Thompson-Nicola Region: Zoht 5, Zoht 4 and Joeyaksa 2 (Lower Nicola Indian Band). Fifteen Aboriginal communities located in the region have been identified as potentially affected by the Project, and these communities have 41 IRs located in the Socio-Economic RSA of the Fraser-Fort George/Thompson-Nicola Region. There are eight additional IRs in the region belonging to Aboriginal communities not identified as directly affected by the Project. More detailed overviews of these Aboriginal communities and reserves, including those crossed by the proposed pipeline corridor, are found in Section 5.4.

Several land use plans in the region state objectives pertaining to Aboriginal land use. The Eight Peaks SRMP indicates that Aboriginal communities' knowledge, rights and traditional uses should be considered to improve resource management in the area (BC ILMB 2002). The TNRD RGS notes its goal to promote joint planning with Aboriginal communities (TNRD 2000).

7.2.5 Indian Reserves, Métis Settlements and Asserted Traditional Territories - Fraser Valley Region

Seven IRs are crossed by the proposed pipeline corridor in the region: Ohamil 1 (Shxw'ōwhámel First Nation), Peters 1 and 1A (Peters Band), Popkum 1 (Popkum First Nation), Grass 15 (several Aboriginal communities), Tzeachten 13 (Tzeachten First Nation) and Matsqui Main 2 (Matsqui First Nation). Twenty-three Aboriginal communities in the Fraser Valley Region have been identified as potentially affected by the Project, and these communities have 77 IRs located in the Socio-Economic RSA of the Fraser Valley Region. More detailed overviews of these Aboriginal communities and reserves are found in Section 5.5. There are 11 additional IRs in the region belonging to Aboriginal communities not identified as directly affected by the Project.

7.2.6 Indian Reserves, Métis Settlements and Asserted Traditional Territories - Metro Vancouver Region

No IRs are crossed by the proposed pipeline corridor in the Metro Vancouver Region. Nine Aboriginal communities in the Metro Vancouver Region have been identified as potentially affected by the Project, and these communities have 18 IRs located in the Socio-Economic RSA of the Metro Vancouver Region. More detailed overviews of these Aboriginal communities and reserves are found in Section 5.6. There are three additional IRs in the region belonging to Aboriginal communities not identified as directly affected by the Project.

7.3 Residential Use

This subsection identifies residential use areas crossed by and near the proposed pipeline corridor in each Socio-Economic Region. For the purposes of this assessment, residential use areas as identified through available municipal maps and plans are the focus of discussion, as opposed to particular residential properties. Residential use areas may encompass municipal parks, playgrounds and schools as well as housing. One of the key routing principles for the Project is the avoidance of residential areas to the greatest extent practical. Several routing decisions have been made to avoid more densely populated residential areas (*i.e.,* avoidance of the Westsyde neighbourhood in the City of Kamloops).

Residential use is inherently connected to various aspects of the urban landscape and community use assets including municipal parks, playgrounds and schools as well as housing. Community assets along the proposed pipeline corridor and in the HORU LSA — such as municipal parks, playgrounds, schools, and other public use assets — are discussed in Sections 7.1 and 6.0. Educational services are discussed in Section 8.5 and general housing capacity is discussed in Section 8.4. This section focuses on residential areas within the proposed pipeline corridor and the HORU LSA.

7.3.1 Residential Use – Edmonton Region

In the Edmonton Region, the proposed pipeline corridor predominately crosses urban and residential centres such as the Sherwood Park, the City of Edmonton, the City of Spruce Grove and the Town of Stony Plain. Rural residential parcels are also present within the Edmonton Region and are typically located in the western portion.

Generally, other Project facilities do not occur in areas designated for residential use. The Edmonton Terminal is located in the boundaries of Strathcona County, but is not located in the vicinity of a residential neighbourhood. The nearest residences lie approximately 1.9 km northwest and southeast of the terminal. The Gainford Pump Station is located in the boundaries of Parkland County, but is not located in a residential neighbourhood. The nearest residence lies approximately 140 metres east of the site.

In the Edmonton Region, the proposed pipeline corridor crosses the municipalities of the City of Edmonton, the City of Spruce Grove, the Town of Stony Plain and the Village of Wabamun. The proposed pipeline corridor also crosses Strathcona County, along the boundary of a residential area (within 100 m) from approximately RK 3 to RK 5.2 according to the Strathcona County MDP. However, the proposed pipeline corridor is within the TUC (Strathcona County 2007). In the City of Edmonton, the proposed pipeline corridor crosses through an area zoned as developing, planned and future neighbourhoods from approximately RK 42 to RK 45. The Edmonton MDP explains that the completion of these neighbourhoods is dependent on achieving population thresholds, the use of existing infrastructure and the provision of new infrastructure and public services (City of Edmonton 2010). There currently have been no residences identified in areas crossed by the proposed pipeline corridor in the City of Edmonton. In the City of Spruce Grove, the proposed pipeline corridor crosses two areas that are zoned for residential use (approximately RK 61 and RK 63). The Spruce Grove MDP aims to increase residential densities, and requires buffering or screening between residential lands and incompatible land uses. The Spruce Grove MDP also mentions that it will work with the Town of Stony Plain to create road and trail connections with residential areas (south of Highway 16A, where the proposed pipeline corridor crosses at approximately RK 61) (City of Spruce Grove 2010). Residential properties with residences are crossed by the proposed pipeline corridor in the City of Spruce Grove.

In the Town of Stony Plain, the proposed pipeline corridor crosses through several areas zoned for urban residential use at approximately RK 63, RK 67 and RK 68 according to the Stony Plain MDP. It is the objective of the Stony Plain MDP to develop complete neighbourhoods (with local facilities and services) within these zones (Armin A. Preiksaitis & Associates 2005). A modular home development is located approximately one kilometre south of RK 66, in the Town of Stony Plain (Frostad pers. comm.). There have been no residences identified in areas crossed by the proposed pipeline corridor in the Town of Stony Plain to date. In the Village of Wabamun, the proposed pipeline corridor does not cross through land zoned for residential use, nor residential properties (Village of Wabamun 2010). There currently have been no residences identified in areas crossed by the proposed pipeline corridor in the Village of Wabamun.

The proposed pipeline corridor also crosses the Hamlet of Entwistle, as well as rural residences in the Edmonton Region. Rural residential properties crossed by the proposed pipeline corridor generally occur near incorporated municipalities and hamlets, including: the Town of Stony Plain, the City of Spruce Grove, the Hamlet of Entwistle and the Village of Wabamun. In Parkland County, the proposed pipeline corridor crosses through land zoned as country residential core (approximately RK 74 to RK 77, and RK 81, RK 111 to RK 115). Most of the county's population resides in country residential subdivisions. The Parkland County MDP notes that it aims to use more compact land-use planning techniques in order to become more economically and environmentally sustainable. The Parkland County MDP recognizes that any further residential development must respect utility and transportation rights-of-way and requests that future rights-of-way for pipelines avoid residential areas by following existing rights-of-way or property lines (Parkland County 2007). From the Town of Stony Plain to Highway 43 there is a high density of country residential land use (approximately RK 67 to RK 92) (Hanlan pers. comm.).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to residential use in the Edmonton Region.

- The proposed pipeline corridor in Strathcona County is close to residential areas which, depending on construction timing, could be an issue (Mills pers. comm.).
- The City of Spruce Grove has residential plans for the southern portion of the city (Irving pers. comm.).
- In the area between the Town of Stony Plain and Highway 43, Parkland County noted that residents are sensitive to any issues (Hanlan pers. comm.).

7.3.2 Residential Use – Rural Alberta Region

In the Rural Alberta Region, the proposed pipeline corridor crosses residential land use in the Town of Edson and Town of Hinton.

The Niton, Wolf, Edson and Hinton Pump Stations are not located in areas designated for residential use. The nearest residences are approximately 1 km southwest of the Niton Pump Station, 600 m west-southwest of the Wolf Pump Station, 360 m southwest of the Edson Pump Station and 820 m southwest of the Hinton Pump Station.

The proposed pipeline corridor crosses through both the Edson and Hinton Planning Areas, which are the two urban areas of Yellowhead County. According to the land use map of the Edson Municipal Development Plan, the proposed pipeline corridor crosses through areas zoned as residential (approximately RK 230 to RK 233), Residential Low Density – Unserviced (approximately RK 236 to RK 237) and Residential Low Density – Serviced (approximately RK 234). By and large, Edson is a low-density residential town. The Edson MDP recognizes that the oil and gas pipelines located in the west of the town could impede development in that area and states that all development close to gas pipelines and facilities must meet the minimum setbacks outlined by the AER (Town of Edson 2006). Within the Town of Edson, the northern portion of the proposed pipeline corridor is mainly residential. Zoning changes have occurred to the area directly south of RK 231 where a new residential area (Hillendale Phase II) is planned for construction in early 2013 (108 lots, 2 apartments and some multiplex lots). There is new residential/commercial construction planned south of the right-of-way. Land use along the proposed pipeline corridor, within the Town of Edson, is mainly residential. The area directly south of RK 230 has seen recent residential/commercial development; land directly north of RK 231 to RK 232 is planned for future residential development; and land directly south of RK 232.5 and north of RK 233 to RK 233.5 was purchased by a developer in 2007/08 but has not yet been developed. Land in the west of the Town of Edson is not serviced by municipal sewer or water so there is limited development (Lemieux pers. comm.).

The proposed pipeline corridor crosses in close proximity (approximately 500 m from the southern boundary) of the community districts Terrace Heights, Hillcrest, Eaton and Thompson Lake. The Hinton MDP indicates future residential and recreational development in both the Eaton and Thompson Lake districts. The proposed pipeline corridor also crosses through two areas zoned as future growth areas at approximately RK 326 and RK 327 to RK 329. The Hinton MDP describes these as suitable areas for urban expansion when growth is anticipated (Town of Hinton 1998). This plan does not specify any restrictions or considerations pertaining to pipeline construction within areas zoned as future growth areas.

In the Rural Alberta Region, the proposed pipeline corridor also crosses through three Hamlet Growth Areas: Niton Junction (approximately RK 187), Wildwood (approximately RK 151) and Evansburg (approximately RK 137). The Yellowhead County MDP notes that these Growth Areas have a 3 km radius around existing hamlets and provides space to accommodate new development. It is the county's objective to support these Hamlet Growth Areas as the preferred area for future residential growth. This plan does not specify any restrictions or considerations pertaining to pipeline construction within areas

zoned as hamlet growth areas. Within the Yellowhead County MDP objectives of each hamlet are outlined.

- **Evansburg:** A hamlet of 765 people, mainly a commercial and institutional service centre along Highway 16. Yellowhead County encourages residential, commercial and industrial development within this hamlet.

- **Niton:** A hamlet of 80 people, the Yellowhead County MDP describes Niton as a highway commercial node. The county encourages infill development before expanding the hamlet.

- **Wildwood:** A hamlet of 279 residents, but its population is declining. Since there is vacant and developable land, the county supports future development within Wildwood.

The county also supports residential growth within the Foothills Policy Area and the Mountain View Policy Area because of the county's easy access to Highway 16 and natural resources (Yellowhead County 2006).

Rural residential properties crossed by the proposed pipeline corridor generally occur near incorporated municipalities and hamlets. Rural residential properties crossed by the proposed pipeline corridor occur near the Town of Edson and the Town of Hinton.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), no issues were identified with respect to residential use in the Rural Alberta Region.

7.3.3 Residential Use – Jasper National Park Region

In the Jasper National Park Region, the Jasper Pump Station is located in the boundaries of the Municipality of Jasper, but is not located in the vicinity of a residential neighbourhood.

The existing TMPL right-of-way parallels Highway 16 and Wynd Road south of the Municipality of Jasper, and follows the southern margin of the municipality. Most residential development in the municipality is concentrated along the municipality's northern margins, north of the downtown area, and is approximately 300–500 m from the existing TMPL. At the western end of the townsite, some homes are as near as 100 m to the existing TMPL right-of-way. The CN Railway mainline is located between the existing TMPL right-of-way pipeline and residences in this area (TERA Environmental Consultants 2005).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), no issues were identified with respect to residential use in the Jasper National Park Region.

7.3.4 Residential Use – Fraser-Fort George/Thompson-Nicola Region

In the Fraser-Fort George/Thompson-Nicola Region, the proposed pipeline corridor crosses various types of residential land use, from rural parcels with residences to urban centres such as the City of Kamloops.

Generally, other Project facilities do not occur in densely populated residential areas and do not lie on land designated for residential use. There are some residential use in nearby areas, however, the nearest residences to Project facilities are: approximately 30 m east and south of the Blue River Pump Station, 150 m north-northwest of the Blackpool Pump Station, 150 m south of the Darfield Pump Station, 600 m south of the Black Pines Pump Station, 520 m southeast of the Kamloops Pump Station and 300 m southwest of the Albreda Pump Station. There are no residences located within 2 km of the Rearguard Pump Station or the Stump Pump Station.

The proposed pipeline corridor crosses the municipalities of the District of Clearwater, the City of Kamloops and the City of Merritt. In the District of Clearwater, the proposed pipeline corridor crosses land zoned as urban residential from approximately RK 720.8 to RK 721.9, suburban residential from approximately RK 722.4 to RK 723.5 and country residential from RK 720.6 to RK 720.8 and at RK 719.0 and RK 726.5 (District of Clearwater 2012). Residential properties with residences currently exist in the

land zoned as urban, suburban and country residential in the District of Clearwater, and are crossed by the proposed pipeline corridor. In the City of Kamloops, the proposed pipeline corridor crosses two special residential development areas (Brocklehurst West at approximately RK 845 and Batchelor Hills at approximately RK 840) outlined in the Kamloops Official Community Plan 2004 (City of Kamloops 2004). The Kamloops Airport Land Use and Development Plan indicates that the proposed pipeline corridor crosses land that is zoned for future residential use (approximately RK 845) (Urban Systems 2000). There currently have been no residences identified in areas crossed by the proposed pipeline corridor in the City of Kamloops. In the City of Merritt, the proposed pipeline corridor does not cross land designated for residential use. In the TNRD, the RGS encourages communities to develop urban residential areas in a compact and sustainable manner, protect and improve quality of natural environment, minimize impacts on adjacent resources, ensure that OCPs are in line with the TNRD RGS and review the Fringe Area (TNRD 2000).

The proposed pipeline corridor also crosses unincorporated communities, including Avola, Blue River and Little Fort, as well as rural residences in the Fraser-Fort George/Thompson-Nicola Region. The proposed pipeline corridor crosses residential properties in Avola and Blue River, areas which are defined as Settlement Resource Management Zones (RMZs) in the Kamloops LRMP. Settlement RMZs delineate Crown lands proposed for settlement use (BC ILMB 1995). Moreover, the Blue River OCP delineates areas zoned for existing and future residential use. The proposed pipeline corridor crosses these land zones from approximately RK 614 to RK 616 (TNRD 2011). Of note, the Blue River OCP indicates that citing for new construction must not trespass the Trans Mountain Pipeline easement. The Blue River OCP also anticipates residential expansion within the next 5 to 10 years.

Rural residential properties crossed by the proposed pipeline corridor generally occur near incorporated and unincorporated communities. Clusters of rural residential properties crossed by the proposed pipeline corridor occur near: Village of Valemount, Blue River, Avola, Vavenby District of Clearwater, Little Fort, City of Kamloops and City of Merritt. According to the Fraser-Fort George Regional District Robson Valley-Canoe Upstream OCP, the proposed pipeline corridor crosses areas zoned as rural residential (approximately RK 518 and RK 521 to RK 524) and Rural Holdings (approximately RK 525 to RK 526 and RK 530) (RDFFG 2010). In the TNRD, the RGS encourages growth of rural residential development in existing settlement areas and in a cluster-like design, to protect environmental and aesthetic values, to avoid hazardous areas and to mitigate impacts (TNRD 2000). Rural residential development is discouraged in the fringe area of the TNRD (and encouraged in urban areas) (TNRD 2012).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to residential use in the Fraser-Fort George/Thompson-Nicola Region.

- In the City of Kamloops, many property owners have built sheds and fences on the existing right-of-way. It was noted that most residents do not apply for permits for minor developments (*e.g.,* sheds, fences) (Lambright pers. comm.).

7.3.5 Residential Use – Fraser Valley Region

In the Fraser Valley Region, the proposed pipeline corridor crosses various types of residential land use, including rural parcels with residences and urban areas.

Generally, other Project facilities do not occur in densely populated residential areas or on land designated for residential use. The nearest residences to Project facilities are: approximately 200 m north of the Hope Pump Station, 400 m southwest of the Wahleach Pump Station, 110 m southeast of the Sumas Pump Station and 60 m south of the Sumas Terminal. The Sumas Terminal is located in the vicinity of a residential neighbourhood in the City of Abbotsford.

In the Fraser Valley Region, the proposed pipeline corridor crosses the municipalities of the District of Hope, the City of Chilliwack and the City of Abbotsford. In the District of Hope the proposed pipeline corridor crosses areas zoned for country residential (approximately RK 1038.6, RK 1041.6, RK 1046.6 and RK 1047.6), single family residential (approximately RK 1042.6, RK 1045.6 and RK 1046.6), multiple

family residential (approximately RK 1044.6) and a mobile home park (approximately RK 1048.6). According to the Hope OCP, country residential are defined as large lots with single-family homes with on-site services or limited municipal services (and may also include agricultural uses). Single family residential is defined as detached dwellings of varying sizes where multiple family residential is defined as housing with at least three individual dwelling units (District of Hope 2004, 2011). Residential properties with residences currently exist in the land zoned for residential use in the District of Hope, and are crossed by the proposed pipeline corridor. The proposed pipeline also crosses through an area designated as institutional by the Hope OCP at approximately RK 1044.1. The Mount Hope Seventh-Day Adventist Church is located in this area in the HORU LSA.

In Chilliwack, the proposed pipeline corridor crosses areas zoned as one-family residential (approximately RK 1097.8 to RK 1098.6, RK 1099 and RK 1099.3 to RK 1099.8), low density multi-family residential (approximately RK 1097.1) and Rural Residential (approximately RK 1104.8). In the One-Family Residential Zone, the following uses are permitted: one family residential, temporary accessory dwelling, boarding, urban ancillary uses and accessory home occupation. In the Low Density Multi-Family Residential Zone, the following uses are permitted: one or two family residential use, multi-family residential, urban ancillary uses and accessory home occupation. In the Rural Residential Zone, the following uses are permitted: one family residential, temporary accessory dwelling, restricted agriculture, boarding, rural ancillary uses, incidental agricultural sales, accessory home occupation, cottage industry and conditional agriculture (City of Chilliwack 2001). Residential properties with residences currently exist in the land zoned for residential use in the City of Chilliwack, and are crossed by the proposed pipeline corridor.

In the City of Abbotsford, the proposed pipeline corridor crosses two areas zoned as urban residential at approximately RK 1117.6 and RK 1120.6, and an area zoned as city residential at approximately RK 1118.6 according to the Abbotsford OCP. The OCP describes urban residential as neighbourhoods of "ground-oriented" housing at low density, and describes city residential as neighbourhoods with higher density residences (such as apartments and townhouses) (City of Abbotsford 2005). Residential properties with residences currently exist in the land zoned for residential use in the City of Abbotsford, and are crossed by the proposed pipeline corridor. In the City of Abbotsford, there been a fair amount of development around the existing right-of-way (Teichroeb pers. comm.). There are also developments anticipated on ‘top of Sumas Mountain’, including the Augustan area which is anticipating approximately 1,500 new homes, and the Vicarro Ranch (Teichroeb pers. comm.).

The proposed pipeline corridor also crosses unincorporated communities, including Othello and Popkum, as well as rural residences in the Fraser Valley Region. Rural residential properties crossed by the proposed pipeline corridor generally occur near incorporated and unincorporated communities. In the Popkum area, the proposed pipeline corridor crosses land zoned as a suburban residential area from approximately RK 1081.5 to RK 1081.8. The Popkum-Bridal Falls Area D OCP states that uses permitted in this area include residential uses, hobby farms, utilities and local public and semi-public uses (FVRD 1997).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to residential use in the Fraser Valley Region:

- At the Merritt Community Workshop, it was noted that there is a cabin located near the Britton Creek Rest Area near the Coquihalla Summit Recreation Area.

- The City of Chilliwack raised concerns regarding impacts on properties (Stanton pers. comm.). It was noted that the city’s development is restricted by the urban containment boundary (Sanderson pers. comm.). Concern regarding the value of private residences was also raised at the Chilliwack Community Workshop.

- General concerns about the proposed pipeline corridor crossing private residential land and residential neighbourhoods were identified at the Chilliwack Community Workshop.

- It was noted that it will be important that there is clear information that will be shared with people whose property will be impacted (Teichroeb pers. comm.).

- The two spills on Sumas Mountain have made the local community highly sensitized to the pipeline and potential environmental issues (Teichroeb pers. comm.).

7.3.6 Residential Use – Metro Vancouver Region

In the Metro Vancouver Region, the proposed pipeline corridor crosses residential land use in urban and rural settings within municipal boundaries.

The Burnaby and Westridge Marine terminals are located in the vicinity of residential use land in the City of Burnaby. The nearest residences to Project facilities are approximately 50 m west of the Burnaby Terminal and 75 m south of the property boundaries of the Westridge Marine Terminal.

In the Metro Vancouver Region, the proposed pipeline corridor crosses the municipalities of the Township of Langley, the City of Surrey, the City of Coquitlam and the City of Burnaby. In the Township of Langley, the proposed pipeline corridor crosses an area zoned for residential use (approximately RK 1146.6), which the Langley OCP labels as Salmon River Uplands (Township of Langley 1979). Residential properties with residences currently exist in the land zoned for residential use in the Township of Langley, and are crossed by the proposed pipeline corridor. At the Langley Community Workshop, it was noted that there is a new suburban development at Castle Hill near approximately RK 1147 to RK 1148. In the City of Surrey, the proposed pipeline corridor does not cross urban development plans or residential areas (Luymes pers. comm.). There currently have been no residences identified in areas crossed by the proposed pipeline corridor in the City of Surrey.

In the City of Coquitlam, the proposed pipeline corridor crosses areas zoned as high and medium density apartments, compact one-family residential and neighbourhood attached residential (approximately RK 1174.6) according to the Lougheed Neighbourhood Plan (City of Coquitlam 2001). Residential properties with residences currently exist in the area crossed by the proposed pipeline corridor in the City of Coquitlam. In the City of Burnaby, the proposed pipeline corridor crosses various residential areas, including areas zoned as single family suburban (approximately RK 1182), single and two family urban (approximately RK 2), urban village (approximately RK 1181) and a town centre (approximately RK 1174.6 to RK 1175.6) known as Lougheed Town Centre, according to the Burnaby OCP (City of Burnaby 1998). The Burnaby OCP describes town centres as having high-density housing and commercial activities. Urban villages are described as multi-family development areas with some commercial facilities. Single family suburban and single and two family urban are both described as residential neighbourhoods. The urban village and residential neighbourhood that the proposed pipeline corridor crosses is called Westridge (City of Burnaby 1998). Residential properties with residences currently exist in the area crossed by the proposed pipeline corridor in the City of Burnaby.

The proposed pipeline corridor also encounters residential properties that are not in an urban area, particularly in the Township of Langley. Rural residential properties with residences currently exist in portions of the Township of Langley, and are crossed by the proposed pipeline corridor, for example near RK 1141 and RK 1145.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to residential use in the Metro Vancouver Region.

- In the Township of Langley, the area along the existing right-of-way is not likely to see future growth. Growth for the Township growth is anticipated to be south of the Trans Canada Highway (Seifi pers. comm.).

- The Walnut Grove area of the Township of Langley may see some development, but it will likely be replacements and infills (Seifi pers. comm.). There are many single family lots near the existing line in this area ($500,000 to $700,000 range housing values); therefore, it will likely be a sensitive area

(Seifi pers. comm.). Residential development of Walnut Grove was identified at the Langley Community Workshop.

- Concern that property values may drop in areas close to the proposed pipeline corridor was identified at the Coquitlam Community Workshop.

- Maillardville (the French Quarter), a neighbourhood in the City of Coquitlam, is a tourism area. The proposed pipeline corridor crosses the Maillardville neighbourhood in the City of Coquitlam from approximately RK 1173.1 to RK 1174.1.

- The Township of Langley noted concern that pile driving during construction would be noisy and disruptive to nearby residents (Seifi pers. comm.).

- It was noted that the existing right-of-way in the City of Surrey is very constrained. It will likely be challenging to get more than 18 m for construction (*i.e.,* getting 40 m more will be challenging) (Baron pers. comm.).

7.4 Agricultural Use

This subsection discusses agricultural land use located along the proposed pipeline corridor and in the HORU LSA. A notable portion of the proposed pipeline corridor crosses land used for agricultural purposes. Agriculture is an important component of both Alberta and BC economics. In 2011, agriculture was 1.8% of Alberta's GDP with farm receipts of $10.5 billion; in BC agriculture contributed to 1.6% of the provincial GDP with farm receipts of $2.6 billion.

Refer to the Agricultural Assessment Technical Report of Volume 5D for a full discussion of agricultural use, including livestock and agricultural facilities.

Alberta has a system of grazing management which includes grazing leases and permits that are granted to individual ranches, and grazing management agreements that transfer authority for livestock management on Provincial grazing reserves to livestock management/grazing associations (AESRD 2012a). There are 10 forest grazing licenses, 30 grazing leases and 4 grazing permits crossed by the proposed pipeline corridor in Alberta (see Table B-3 in Appendix B).

BC has both grazing leases and range tenures. Grazing leases are 20-year tenures which are issued under the province's Land Act (Data BC 2013). Range tenures are governed by BC's Range Tenure act and are applied to areas of Crown rangeland (BC MFLNRO 2013a). There are 37 provincially listed range tenures crossed by the proposed pipeline corridor in BC (see Table B-4 in Appendix B for information on range tenures crossed by the proposed pipeline corridor in BC). In addition, there are 80 provincially listed grazing leases crossed by the proposed pipeline corridor in BC (see Table B-5 in Appendix B).

In BC, the Agricultural Land Commission (ALC) is a provincial agency that governs the Agricultural Land Reserve (ALR), which is a provincial zone where agriculture is the primary use of the land or land that has the potential for agricultural production (Provincial ALC 2013). ALR land is crossed multiple times by the proposed pipeline corridor (see Table B-5 in Appendix B).

There is a range of different agricultural land uses found along the proposed pipeline corridor, including:

- natural pasture and grazing areas (consisting of grazed woodlands, grazed open range, and natural pasture);

- field crop areas (consisting of improved pasture tame or hay; corn or grass forage; dry land grain, oil seed and pulse crops; mixed vegetable crops; irrigated alfalfa; turf);

- organic and specialty crop areas (consisting of blueberries, raspberries, mixed berries, organic farms; and container nurseries); and

- livestock and poultry farms (consisting of livestock barns and equestrian facilities).

7.4.1 Agricultural Use – Edmonton Region

In the Edmonton Region, the proposed pipeline corridor is located in mixed farmland from the City of Edmonton to the City of Spruce Grove and Town of Stony Plain. In the HORU LSA, the eastern portion of the region consists of large parcels of mixed crop farming; in the western portion there is a mixture of crop lands, grazing beef, hay and pasture. The proposed pipeline corridor also crosses areas of specialty crops (*i.e.,* a berry farm and nursery). There are three beef facilities located within the proposed pipeline corridor.

There are no forest grazing licenses, grazing leases or grazing permits crossed by the proposed pipeline corridor in the Edmonton Region.

Land use crossed by the proposed pipeline corridor in the Edmonton Region is guided by various land use plans, some of which provide direction for agricultural use areas. However, the proposed pipeline corridor does not cross through land zoned for agricultural uses in Strathcona County (Strathcona County 2007), the City of Edmonton (City of Edmonton 2010), the City of Spruce Grove (City of Spruce Grove 2010) or the Village of Wabamun (Village of Wabamun 2010).

The Parkland County MDP encourages future rights-of-way for pipelines to minimize impact on agricultural land by following existing rights-of-way or property lines (Parkland County 2007). The proposed pipeline corridor crosses through several areas zoned for agricultural use in Parkland County, especially in the west. The Parkland County MDP indicates that agriculture is the primary land use within the county, and for this reason it is important to protect these lands. However, the Parkland County MDP does state that non-agricultural uses within agricultural areas may be permitted if it is in accordance with the Parkland County MDP (Parkland County 2007).

The Parkland County Recreation Plan notes that agriculture zones are designed to allow agriculture production and related uses while also allowing limited non-agricultural uses which are deemed compatible. However, the Parkland County Recreation Plan notes that these zones are also well-suited for recreational purposes, such as county-wide special parks, natural areas and greenways (greenways being travel options for motorized and non-motorized uses and wildlife corridors) (RC Strategies 2009)

Although the Town of Stony Plain has historically been an agricultural service centre for the area, the proposed pipeline corridor does not cross through land zoned for agricultural use within the Town of Stony Plain (Armin A. Preiksaitis & Associates 2005).

7.4.2 Agricultural Use – Rural Alberta Region

Along the eastern portion of the Rural Alberta Region, agricultural land within the proposed pipeline corridor is mostly field cropping and pasture, interspersed with forested areas. Towards the western part of the region, forest land becomes more prominent; west of the Town of Edson, agricultural land use is virtually non-existent. There are three beef facilities crossed by proposed pipeline corridor, and there is one beef facility located about 100 m beyond the HORU LSA. There are no specialty crop areas crossed by the Project in this region.

There are numerous forest grazing licenses, grazing leases and grazing permits crossed by the proposed pipeline corridor in the region. Table B-3 in Appendix B provides the location.

Land use crossed by the proposed pipeline corridor in the Rural Alberta Region is guided by various land use plans, some of which provide direction for agricultural use areas. The proposed pipeline corridor in Yellowhead County crosses through an Agricultural Policy Area from approximately RK 135 to RK 163. The Yellowhead County MDP describes this area as having agriculture as its primary land use and states that these agricultural lands should be protected from fragmentation. However, the MDP further states that it will allow some subdivision of lands within the area that are deemed nonessential for agricultural

production. The proposed pipeline corridor also crosses through the Rural Policy Area, which the MDP has deemed an area with lands of Better Agriculture (Yellowhead County 2006).

7.4.3 Agricultural Use – Jasper National Park Region

The Jasper National Park Region does not include agricultural land. There are no forest grazing licenses, grazing leases or grazing permits crossed by the proposed pipeline corridor in the Jasper National Park Region.

7.4.4 Agricultural Use – Fraser-Fort George/Thompson-Nicola Region

In the Fraser-Fort George/Thompson Nicola Region, the northeastern portion of the proposed pipeline corridor is primarily forested but with occasional grazing areas and permanent pastures near the Village of Valemount, Community of Blue River, Community of Avola and District of Clearwater. Beyond the District of Clearwater to the southwest, the North Thompson River valley widens and the land in the valley bottom is mainly pasture and forest grazing. Between Black Pines and the Coquihalla Lakes, the Project passes through almost 100% agricultural land (*e.g.,* either private grazing land or leased or licensed Crown grazing land). The proposed pipeline corridor in this region also passes through field crop areas, including irrigated forage and smaller areas of pasture and irrigated mixed crops.

There are numerous grazing leases and range tenures crossed by the proposed pipeline corridor in the region. Table B-5 in Appendix B provides the name and approximate location of the tenures. At the Kamloops Community Workshop, it was noted that horseback riding and cattle drives are common in ranch lands. At the Merritt Community Workshop, it was noted that free-range cattle grazing occurs from June to September.

The total land in the ALR crossed by the proposed pipeline corridor in the Fraser-Fort George/Thompson-Nicola Region is 137.7 km. Table B-6 in Appendix B summarizes the locations where the ALR is crossed.

The proposed pipeline corridor passes in proximity to 19 beef facilities: of these, 10 are located within the proposed pipeline corridor and 9 are within the HORU LSA. There are no specialty crop areas crossed by or proximate to the Project in this region.

Land use crossed by the proposed pipeline corridor in the Fraser-Fort George/Thompson-Nicola Region is guided by various land use plans, some of which provide direction for agricultural use areas. The proposed pipeline corridor crosses areas zoned as agriculture/resource within the Fraser-Fort George Regional District. The Fraser-Fort George Regional District Robson Valley-Canoe Upstream OCP identifies an objective to protect agricultural areas, especially in areas that have easy access for irrigation. Fragmentation will not be supported in areas deemed to have high agricultural potential. OCP also discourages any non-agricultural activities in agricultural areas, unless there are no alternatives and there will be no long-term impacts to the agriculture potential (RDFFG 2006).

According to the Robson Valley LRMP, the proposed pipeline corridor crosses through settlement/agriculture RMZs (which accounts for 4.9% of the total plan area). Agriculture is an important livelihood in rural areas of Robson Valley. The Settlement/Agriculture RMZ contains primarily privately owned land planned and managed by local government that is used for or proposed to be used for settlement by an OCP, Robson Valley Crown Land Plan or LRMP (BC ILMB 1999). There are several Agricultural Land Reserve areas denoted in the Kamloops LRMP. The proposed pipeline corridor crosses ALR areas outside Clearwater (approximately RK 718 and RK 733), Barriere (approximately RK 769) and the City of Kamloops (approximately RK 853.4) (BC ILMB 1995). A review of the Mount Robson LRMP and the Kamloops LRMP found no management direction or zones in which the construction of a pipeline would be precluded due to agricultural issues. Still, agricultural land is in short supply and the LRMPs include the general objective of reducing the loss of agricultural land by supporting the purpose and intent of the ALR.

Agriculture, grazing and forestry are encouraged in the fringe areas of the TNRD. The Fringe Areas Policy aims to protect agricultural land from development pressures and fragmentation (TNRD 2012). According to the Kamloops Official Community Plan, the proposed pipeline corridor crosses several ALR areas (approximately RK 824, RK 848, RK 850 and RK 857.3) and areas zoned for agricultural use (approximately RK 842, RK 852.4) (City of Kamloops 2004). In the City of Merritt, the proposed pipeline corridor crosses several areas zoned for agricultural use (between approximately RK 925.6 to RK 927.6 and RK 928.6 to RK 930.6) (City of Merritt 2010). The Merritt Zoning Bylaw states that the only uses permitted in the agricultural areas are agricultural use, bed and breakfast, boarding kennels, single family dwellings, single family dwellings with secondary suites, home-based businesses and accessory building (City of Merritt 2011a).

The use of land in the ALR requires a community plan amendment in the City of Kamloops (Lambright pers. comm.).

7.4.5 Agricultural Use – Fraser Valley Region

The Fraser Valley can be divided into several distinct areas with intensive agriculture. Agricultural areas are interspaced with forest land on mountains (Sumas and Vedder mountains) and residential and commercial areas of the City of Chilliwack and City of Abbotsford. The main agricultural land use types within the region are:

- dairy production west of the District of Hope;
- dairy, poultry and field crops between the Community of Rosedale and City of Chilliwack;
- mixed vegetable crops and floriculture, dairy, blueberries and other berries from the City of Chilliwack to Sumas Mountain;
- dairy and blueberries from Sumas Mountain to Matsqui Prairie (City of Abbotsford);
- smaller scale farming including poultry, nurseries, berries and pasture west of Matsqui Prairie; and
- the Matsqui uplands to the Township of Langley-City of Abbotsford border, where a large portion of the designated agricultural land is still covered in forest.

Field crops crossed include tame pasture, corn/grass forage rotation, mixed vegetables and turf production. Several areas of specialty crops are crossed by the proposed pipeline corridor, including a field nursery, a container nursery, a specialty nursery, blueberries, raspberries and organic production.

There is one range tenure and no grazing leases crossed by the proposed pipeline corridor in the region. Table B-5 in Appendix B provides the name and approximate location of the tenures. At the Merritt Community Workshop, concerns regarding creation of unwanted access for cattle was identified.

In the Fraser Valley Region, the proposed pipeline corridor crosses 67.1 km of land in the ALR. Table B-6 in Appendix B summarizes the locations where the ALR is crossed.

The proposed pipeline corridor also passes in proximity to the following agricultural facilities:

- poultry facilities: 17 facilities are within the proposed pipeline corridor, and 29 facilities are located in the HORU LSA;
- dairy facilities: 19 facilities are located within the proposed pipeline corridor, and 36 facilities are located in the HORU LSA;

- equestrian facilities: three facilities are located within the proposed pipeline corridor; and

- other livestock facilities: two facilities are location within the proposed pipeline corridor; and mushroom growing facilities: one facility is located within the proposed pipeline corridor.

Land use for areas crossed by the proposed pipeline corridor in the Fraser Valley Region is guided by various land use plans, some of which provide direction for agricultural use areas. According to the Chilliwack OCP, the proposed pipeline corridor crosses several areas zoned for agricultural use (approximately RK 1082.6 to RK 1094.6, RK 1100.6 to RK 1101.6 and RK 1103.6 to RK 1107.6). Due to the high quality of soil within the area, much of Chilliwack's land is used for agriculture (approximately 70% of the land). The OCP predicts that agriculture will become more intensive and economically important for the area. Because of this, there are several objectives and policies to invest in and protect these agricultural areas. This includes discouraging further fragmentation of agricultural land, protecting agricultural land from non-agricultural uses and creating buffers between urban and rural areas (City of Chilliwack 1998).

According to the Chilliwack Zoning Bylaw, the proposed pipeline corridor crosses areas zoned as agriculture lowland (approximately RK 1082.7 to RK 1091.2; RK 1091.6 to RK 1095.9; RK 1098.6 to RK 1099.5; RK 1099.8 to RK 1102; RK 1102.8 to RK 1103.4; RK 1103.9 to RK 1104.6; and RK 1104.9 to RK 1107.9), agriculture small lot (approximately RK 1099.1) and agriculture food processing (approximately RK 1099.5 to RK 1099.8). The agriculture lowland zone is described as land within the ALR or land generally well suited for agricultural use. The following uses are permitted in this zone: accessory seasonal employee residential use, general agriculture, conditional agriculture, intensive agriculture, incidental agricultural sales, one family residential, accessory dwelling unit, temporary accessory dwelling, boarding, rural ancillary uses, accessory home occupation and cottage industry. The following uses are permitted within the agriculture small Lot zone: general agriculture, conditional agriculture, incidental agricultural sales, one family residential, accessory dwelling unit, temporary accessory dwelling, boarding, rural ancillary uses, accessory home occupation and cottage industry. The following uses are permitted within the agriculture food processing zone: general agriculture, food processing, warehousing, accessory dwelling unit, accessory office and sales (City of Chilliwack 2001).

The City of Chilliwack has two-thirds of its 25,900 hectares reserved for agriculture and has one of the most productive agriculture areas in Canada. There are over 800 farms, the industry supports more than 4,500 jobs and it generates over $600 million in economic activity (Don Cameron Associates 2012). The Chilliwack Agricultural Area Plan outlines strategies to protect and improve agricultural practices within Chilliwack, which includes: creating an Agricultural Advisory Committee to advise Council on agricultural land uses; protecting ALR lands; non-permitted uses in the ALR; and buffering between farms and other uses (Don Cameron Associates 2012).

In the City of Abbotsford, the proposed pipeline corridor crosses a large area zoned for agricultural use (approximately RK 1104.6 to RK 1114.6 and RK 1121.6 to RK 1136.6). The OCP states that most of the land zoned for agricultural use is within the ALR and thus management is limited by the *Farm Practices Protection (Right to Farm) Act* and the *Agricultural Land Commission Act* (City of Abbotsford 2005).

7.4.6 Agricultural Use – Metro Vancouver Region

In the Metro Vancouver Region, the proposed pipeline corridor crosses some agricultural land mainly located in the Salmon River valley near Fort Langley, BC.

The total land in the ALR is crossed by the proposed pipeline corridor in the Metro Vancouver Region is 7 km. Table B-6 in Appendix B summarizes the locations where the ALR is crossed.

There are no range tenures or grazing leases crossed by the proposed pipeline corridor in the region.

The proposed pipeline corridor does not cross areas of natural pasture and grazing in the region, but does cross areas of field crops. The agricultural land crossed includes: tame pasture, abandoned pasture, a turf farm, and a small stretch of specialty crops represented by a container nursery. The proposed pipeline corridor also crosses in proximity to the following agricultural facilities:

- poultry facilities: four facilities located within the proposed pipeline corridor;
- dairy facilities: two facilities located within the HORU LSA;
- equestrian facilities: one facility located in the proposed pipeline corridor; and
- other livestock facilities: one facility (mink farm) located in the HORU RSA.

Land use crossed by the proposed pipeline corridor in the Metro Vancouver Region is guided by various land use plans, some of which provide direction for agricultural use areas. According to the Metro Vancouver RGS, the proposed pipeline corridor crosses areas zoned for agricultural uses from approximately RK 1137.6 to RK 1153.6. Agriculture covers a large portion of the region's land and is an important sector to the economy. As such, there are several strategies to improve and protect agricultural lands, such as discouraging non-farm uses and farm fragmentation. The RGS further describes that, although utility companies should avoid fragmentation of agricultural areas, if it is unavoidable, mitigation measures should be put into place (such as area enhancement) (Metro Vancouver 20110a).

According to the Langley OCP, the proposed pipeline corridor crosses areas labelled as part of the GVRD 'Green Zone' (approximately RK 1139.6 to RK 1145.6 and RK 1147.6 to RK 1153.6), which is defined as areas that are of agricultural and environmental value (Township of Langley 1979). In Langley, most of the Green Zone is active farmland. The OCP outlines protection strategies for the Green Zone (while encouraging agricultural production) and notes that it is the Township's responsibility to step in to resolve any conflict between farm and non-farm uses in this zone (Township of Langley 1979). At the Langley Community Workshop, construction access on agricultural lands, as well as cattle grazing areas, was identified as a concern.

7.5 Outdoor Recreational Use

This subsection discusses outdoor recreational use areas located in the proposed pipeline corridor and the HORU LSA and HORU RSA.

The Government of Alberta's Recreation Corridor and Trails Designation Program promotes the sustainable growth of recreation trails and provides a framework to assist in assessing trails, help trail groups in planning, design and construction, and aid land managers with operating decisions. Designated recreation corridors and trails promote economic development, tourism and rural diversification, enhance environmental protection, align with other land uses and objectives and honour history and historical investments (ATPR 2012).

The Recreation Sites and Trails branch of the BC MFLNRO manages forest recreation sites in BC in partnership with recreation clubs, forest companies, Aboriginal communities, and local governments and contractors. The sites are located on Crown land and may include campgrounds, day-use areas, boat launches and other facilities that enable the public to enjoy a recreation experience in a forest setting (BC MFLNRO 2012a).

7.5.1 Outdoor Recreational Use – Edmonton Region

A range of outdoor recreational pursuits, such as hiking, dog walking, skating, swimming and sailing are conducted along and near the proposed pipeline corridor and in the HORU LSA of the Edmonton Region. The proposed pipeline corridor is within Edmonton's TUC, which is commonly used for informal recreational activities. Dog walking in the TUC was identified at the Edmonton East and West Community Workshops. The Strathcona Rugby Field, home of the Strathcona Druids Rugby Football Club, and a dog

training facility are located at approximately RK 4.5. The Edmonton East Community Workshop identified Blackmud ravine, located approximately 600 m north of RK 24, as an area used for recreation activities.

There are five provincially-designated recreation trails within the proposed pipeline corridor and HORU LSA. Table B-7 in Appendix B lists provincially-designated trails along the proposed pipeline corridor and in the HORU LSA in Alberta.

Thirteen commercial recreation use areas are located in the proposed pipeline corridor and HORU LSA of the Edmonton Region. Table B-8 in Appendix B summarizes commercial recreation use areas along the proposed pipeline corridor and the HORU LSA in the Edmonton Region.

Many of the land use and development plans pertinent to the region outline objectives pertaining to outdoor recreation use, as noted below.

The Strathcona County MDP aims to maintain and expand the existing trail network and implement recommendations laid out in the Strathcona County Trails Master Plan as well as ensuring that issues related to recreational and trail development within (or close to) industrial areas are addressed (Strathcona County 2007).

The City of Edmonton plans to develop a coordinated network of trails, which would connect different areas of the city and the region. Part of this plan is to integrate utility corridors into this network (City of Edmonton 2009). The proposed pipeline corridor does not cross through areas used for outdoor recreational purposes in the City of Edmonton (City of Edmonton 2010). Within the City of Edmonton, the proposed pipeline corridor crosses and parallels the West River Trail (approximately RK 33.2 to RK 34.5), located in the North Saskatchewan River valley (River Valley Alliance 2013).

The Parkland County Recreation, Parks & Open Space Plan aims to expand rural non-motorized trails in order to connect rural communities, of which priority will be given to connections with major multi-jurisdictional resources (such as the TransCanada Trails) (RC Strategies 2009).

The City of Spruce Grove offers a range of outdoor recreational activities, however, the proposed pipeline corridor does not cross through areas zoned for this use (City of Spruce Grove 2010).

The proposed pipeline corridor crosses over two areas zoned for future trail routes in the Town of Stony Plain, at approximately RK 62. The Town of Stony Plain also has a Trail Master Plan, which recommends future trail extensions and development standards (Armin A. Preiksaitis & Associates 2005).

The proposed pipeline corridor does not cross through areas zoned for outdoor recreational use in the Village of Wabamun. Due to the development of Wabamun Lakefront Park, a private marine and boat launch, marine recreational and tourism use has increased in the village. Boating enthusiasts from the City of Edmonton are the primary demographic (Village of Wabamun 2010). Pineridge Golf Resort is located in the HORU LSA, approximately 400 m south of RK 117.

Two Provincial Parks are located in the HORU LSA, however none are crossed by the proposed pipeline corridor in the Edmonton Region. Section 7.1.1 provides a description of provincial parks encountered by the proposed pipeline corridor.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to outdoor recreational uses in the Edmonton Region:

- some communities use the TUC for walking their dogs (Mills pers comm.); and
- at the Edmonton Community Workshop, it was noted that Blackmud Ravine is used for recreation.

Tourism and recreation opportunities are abundant throughout the HORU RSA of the Edmonton Region. The Alberta Recreation Survey for Edmonton lists walking, golf, camping and swimming as top outdoor recreation activities occurring in the Edmonton area (ATPR 2008). In Strathcona County, recreation activity is focused on lakes and in the south of the county (Mills pers. comm.). Lake Wabamun (approximately 1 km south of RK 95 to RK 117) offers multiple outdoor recreation uses including sailing, waterskiing, fishing and boating. The Village of Wabamun has the largest land-locked sailing club in western Canada (Hannah pers. comm.). At the Wabamun Community Workshop, it was noted that snowmobiling occurs on the lake, and that there is a paved trail system through the Wabamun Lake Provincial Park. There is a Trail Seekers trail system in the Wabamun area (Wabamun Community Workshop).

Pembina Tubing operates a commercial recreation business on the Pembina River. Tubing takes place south of the proposed pipeline corridor (RK 135) and travels through Pembina River Provincial Park. Kayaking also takes place on the Pembina River (Hanlan pers. comm.). Many parks and protected areas extending to the HORU RSA offer recreational opportunities including hiking, fishing, boating and camping. Table B-1 in Appendix B lists parks and protected areas in the HORU RSA in Alberta.

7.5.2 Outdoor Recreational Use – Rural Alberta Region

Outdoor recreational pursuits, such as hiking, snowmobiling and use of all-terrain vehicles (ATVs), are conducted along the proposed pipeline corridor and in the HORU LSA of the Rural Alberta Region. However, most outdoor recreation in the Rural Alberta Region occurs north and west of the Project.

There are 53 recreation trails within the proposed pipeline corridor and HORU LSA. At the Hinton Community Workshop, it was noted that trails are heavily used by the community for cycling, ATVing, horseback riding, walking and hiking. Table B-7 in Appendix B provides a list of trails along the proposed pipeline corridor and in the HORU LSA in Alberta.

Seventeen commercial recreation use areas are located in the proposed pipeline corridor and the HORU LSA of the Rural Alberta Region. Table B-8 in Appendix B summarizes commercial recreation use areas along the proposed pipeline corridor and in the HORU LSA of the Rural Alberta Region.

The existing Trans Mountain pipeline is used for recreational purposes in various parts of the region. For example, residents from the Town of Hinton use the existing TMPL right-of-way as a recreation corridor (Kreiner pers. comm.). The existing TMPL right-of-way in the Town of Edson is also used by ATVs and snowmobiles (Lemieux pers. comm.).

The Town of Edson has a baseball tournament on the August long weekend at the Kinsmen ball diamonds, which are crossed by the proposed pipeline corridor from approximately RK 228.8 to RK 229.6. The baseball diamonds are used consistently through the summer season (Butler pers. comm.). At the Hinton Community Workshop it was noted that the proposed pipeline corridor crosses trails developed and maintained by the bicycle association, Bike Hinton.

Many of the land use and development plans pertinent to the region outline objectives pertaining to outdoor recreation use, as noted below.

Yellowhead County is working with the Province of Alberta to protect public access to Crown Lands for recreational use and to create a county-wide trail system (Yellowhead County 2006).

The Town of Edson has plans to use some of the existing TMPL right-of-way as pedestrian trail links between parks and open spaces (Town of Edson 2006).

The Hinton MDP states that land along the banks of creeks, rivers and lakes must be protected for recreational access. Any development close by must create a transition between development and natural areas (Town of Hinton 1998). The proposed pipeline corridor crosses 'gravel or unimproved' trails at approximately RK 323. The Hinton Parks Master Plan notes that multi-purpose trails may be located within utility rights-of-way (ISL Infrastructure Systems 2003).

Many provincial parks in the HORU LSA offer recreational opportunities including hiking, fishing, boating and camping. Obed Lake Provincial Park is located in the HORU LSA in this region. Section 7.1.2 provides a description of provincial parks encountered by the proposed pipeline corridor.

As noted, most of the outdoor recreation areas in the Rural Alberta Region occur in the HORU RSA, north and west of the Project, as well as in certain areas of Hinton and Edson beyond the HORU LSA. The Town of Hinton has a trail master plan. Residents of Hinton value the trail system and the Town plans to develop a new trail as described in the Town of Hinton Trails Master Plan which would be crossed by the proposed pipeline corridor (Engerdahl pers. comm.). Outside of the Town of Edson, the Hornbeck Park and Silver Summit areas are used for skiing (Ramme, Lyons pers. comm.).

In Yellowhead County, a variety of recreational activities occur such as snowmobiling, cross-country skiing, ATVing, mountain biking, canoeing, bird watching, and camping. Camping is common in the southern parts of Yellowhead County (Ramme, Lyons pers. comm.). Many parks and protected areas in the HORU LSA and extending to the HORU RSA offer recreational opportunities including hiking, fishing, boating and camping. The Brule sand dunes, on the eastern shores of Brule Lake (approximately 7 km west of RK 339) are a popular spot for ATVs. There is a designated access road from Highway 16 to Brule Lake (Karmacharya pers. comm.). Robb Road, which is crossed by the proposed pipeline corridor slightly east of RK 322, is part of the Big Horn Trail that runs from Oregon up towards Alaska; this area has high heritage value (Engerdahl pers. comm.). Table B-1 in Appendix B lists parks and protected areas in the HORU RSA in Alberta.

AESRD is working on identifying specific land use 'nodes' as part of the West Yellowhead Corridor Tourism and Recreation project. Nine nodes have been identified west of the Town of Hinton, including the Overlander Node which has been identified for commercial development, recreation and tourism (Karmacharya pers. comm.). This node is crossed by the existing TMPL right-of-way from approximately KP 325 to KP 318, coming within a few hundred metres of RK 339 of the proposed pipeline corridor between Hinton and the eastern border of Jasper National Park.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to outdoor recreational uses in the Rural Alberta Region.

- At the Edson Community Workshop it was noted that ATV and snowmobile users already use parts of the existing TMPL right-of-way and would like this use to continue while some snowmobile trails cross the existing TMPL right-of-way and these trails could be affected by construction; and

- At the Hinton Community Workshop it was noted that ATV use in bike areas is a concern; cyclists seek to restrict ATV use of their trails while ATV users are looking for more trail options.

7.5.3 Outdoor Recreational Use – Jasper National Park Region

The existing TMPL right-of-way and the HORU LSA in the Jasper National Park Region, and some TMPL access roads, are used for winter recreation activities, such as skiing, snowshoeing and walking. Popular access roads include Wynd Road, and various locations along the Celestine Lake Road. The Pipeline Trail along the existing TMPL right-of-way west of the Municipality of Jasper provides cross-country skiing opportunities between Highway 16 and the CN Railway line. Other portions of the existing TMPL right-of-way, including areas near the Snaring campground, are popular cross-country skiing areas (TERA Environmental Consultants 2005).

There is one trail within the existing TMPL right-of-way and the HORU LSA at approximately KP 390.8 (Table B-7 in Appendix B).

There are no commercial recreation use areas are located within the existing TMPL right-of-way in the Jasper National Park Region.

According to the Jasper National Park Management Plan, the entire existing TMPL right-of-way within Jasper National Park is located within Zone IV – Outdoor Recreation. Zone IV encompasses less than 1% of the park's total area, and generally follows the highway corridor through the park. Zone IV objectives include enjoying and appreciating the park's heritage, accommodating a broad range of opportunities for understanding, allowing direct motorized access and providing front-country facilities and easements along park roads. In terms of growth and development, a key action of the Jasper National Park Management Plan is considering proposals for new facilities required for outdoor recreational activities (Parks Canada 2010, TERA Environmental Consultants 2005).

Hiking, jogging, dog walking, mountain biking, horseback riding, cross-country skiing and snowshoeing are popular summer and winter activities in Jasper National Park. Day use, front-country trails that support recreation opportunities in Jasper National Park are located in the HORU LSA. These trails receive heavy use by visitors and residents in both the summer and the winter. Access roads and the existing Trans Mountain pipeline are also used informally for recreation activities. Dog walking, hiking and mountain biking are popular at various locations along the existing Trans Mountain pipeline. Backcountry trail use is reported to be much lower than front-country sites, which support high levels of activity. There are more than 100 backcountry campsites in Jasper, located along 20 main trails (TERA Environmental Consultants 2005).

Winter activities in Jasper National Park are centered on downhill and cross-country skiing, snowboarding, snowshoeing, scenic driving, wildlife viewing, walking and ice skating (TERA Environmental Consultants 2005). The Marmot Basin Ski Resort provides downhill skiing, snowboarding, ice skating and snowshoeing opportunities through the winter. Marmot Basin is located approximately 19 km southwest of the Jasper town site, and offers 80 runs, 607 ha of skiable Rocky Mountain terrain and 900 vertical metres of runs. The opening dates for Marmot Basin are weather dependent, but the facility is generally open from December to April (TERA Environmental Consultants 2005).

7.5.4 Outdoor Recreational Use – Fraser-Fort George/Thompson-Nicola Region

Tourism and recreation opportunities are abundant throughout the HORU LSA and RSA of the Fraser-Fort George/Thompson-Nicola Region. Both local residents and visitors participate in summer activities such as hunting, fishing, boating, golf, mountain biking, hiking, horseback riding, ATV tours and rentals and helicopter tours. Winter activities include cross-country skiing, helicopter skiing, snowmobiling, dog sledding, ice fishing, skating and curling. In the Fraser-Fort George/Thompson Nicola Region, snowmobiling brings in substantial value to tourism economy (Kekula pers. comm.).

There are 23 provincially designated recreation areas and trails crossed by the proposed pipeline corridor and HORU LSA in the Fraser-Fort George/Thompson-Nicola Region. Table B-9 in Appendix B provides a list of provincially designated recreation areas and trails along the proposed pipeline corridor and in the HORU LSA in BC. These include Keyhole Trail, Clemina Creek Trails, Colly Lake Recreation Reserve, Little Angus Home Recreation Reserve, the parking area for Finn Creek, Groundhog Snowmobile Trail, Lac du Bois ATV Area, Lac Le Jeune Snowmobile Trails and 2010 Spirit Trail. It was noted at the Valemount Community Workshop, and in discussion with VARDA, that during the TMX Anchor Loop Project, damage occurred in a wetland area near Clemina Creek related to work crews' use of ATVs; work has been conducted to restore the area since 2007 (Pawliuk pers. comm.).

There are 20 commercial recreation tenures located in the Fraser-Fort George/Thompson-Nicola Region in the proposed pipeline corridor and the HORU LSA. Table B-10 in Appendix B summarizes commercial recreation tenures along the proposed pipeline corridor and in the HORU LSA of the Fraser-Fort George/Thompson-Nicola Region. These include Mount Robson White Water Rafting Co. Ltd., Maligne Rafting Adventures Ltd., Stellar Descents Backcountry Adventures Ltd., and Wildway Safaris and Interior Whitewater Expeditions Ltd., among others. The commercial recreation activities include guided freshwater recreation, heli-skiing, heli-hiking, snowmobiling and community outdoor recreation. Guide outfitters are discussed in Section 7.6.1.4.

Many of BC Parks' protected areas, particularly provincial parks, contain outdoor recreation opportunities. A discussion of these is found in Section 7.1.4. Many of the recreation and tourism opportunities in the region depend on maintaining wildlife, fish, old forests, scenic views, wilderness areas, and on providing full service front-country and backcountry recreation opportunities.

Many of the land use and development plans pertinent to the region outline objectives pertaining to outdoor recreation use, as noted below.

The proposed pipeline corridor crosses the Valemount to Blue River Winter Recreation SRMP (approximately RK 490 to approximately RK 608). This SRMP covers approximately 700,000 ha of land between Mount Robson Park in the east and Wells Gray Park in the west, and from Horsey Creek in the north to Blue River in the south. The SRMP was developed to respond to: compatibility issues between recreation users, such as motorized and non-motorized use areas; risk to the environment including mountain caribou and other wildlife species; and the integration of winter recreation development and other industrial activities in the area. The SRMP delineates a broad range of management zones to maintain opportunities for motorized and non-motorized winter recreation activities, as well as to protect habitat for moose and caribou. The proposed pipeline corridor crosses two snowmobile trails at approximately RK 521 and RK 535.5 as well as a Snowmobile Destination Area from approximately RK 544 to RK 567, as identified in the SRMP (BC ILMB 2005).

The proposed pipeline corridor crosses the Eight Peaks Winter Recreation SRMP (approximately RK 606 to approximately RK 625). This SRMP is intended to establish resource management objectives that create conditions that integrate forestry, heli-skiing and other winter recreation activities while incorporating the principles of sustainability and stewardship. The Fraser-Fort George/Thompson-Nicola Region does not cross any "Stewardship Areas" identified in the Eight Peaks SRMP. The Fraser-Fort George/Thompson-Nicola Region is primarily located in the North Thompson River Valley Winter Recreation Management Unit where activities are largely focused on roads and trails, and are not reliant on a sense of remoteness. The proposed pipeline corridor crosses through two Winter Recreation Management Units identified in the SRMP: North Thompson River Valley (approximately RK 603 to RK 625) and Whitewater (approximately RK 601 to RK 602). The North Thompson River Valley unit focuses on recreational activities that use roads and trails (such as snowmobiling) whereas the Whitewater unit focuses on non-motorized activities (such snowshoeing and skiing). The SRMP recommends that a local advisory committee be established in order to resolve conflicts of overlapping land uses (BC ILMB 2003).

The proposed pipeline corridor crosses the Robson Valley LRMP from approximately RK 489.6 to RK 549.2. This LRMP includes Settlement/Agriculture and Rocky Mountain Trench RMZs, which are identified as important recreation and tourism areas. The LRMP states that that resource development within the Settlement/ Agriculture area must be sensitive to public recreation values (BC ILMB 1999). The Settlement/Agriculture area is located along the proposed pipeline corridor between approximately RK 480 and RK 500.

The proposed pipeline corridor crosses a series of existing and proposed trails identified in the Blue River OCP from approximately RK 612 to RK 616 (TNRD 2011).

The Kamloops Official Community Plan (2004) outlines zones for future parks and trails. The proposed pipeline corridor crosses these zones at approximately RK 837, RK 841, RK 847 and RK 851 (City of Kamloops 2004).

The Village of Valemount Official Community Plan identifies seven parks, recreation and open spaces in the Village, all of which are located outside the proposed pipeline corridor (Village of Valemount 2006).

Within and near communities in the region, there are a wide range of outdoor recreation areas, some of which are on or near the proposed pipeline corridor, as noted below.

- Several organizations based in Valemount (such as the Yellowhead Outdoor Recreation Association and VARDA) use areas outside of the village boundaries for recreational purposes. The proposed

pipeline corridor crosses land outside of Valemount boundaries (Village of Valemount 2006). In the Village of Valemount area, snowmobiling occurs on areas of the existing TMPL right-of-way where there is an agreement with BC MFLNRO (Gislimberti, Latimer pers. comm.).

- The proposed pipeline corridor crosses over a series of existing and proposed trail routes within the Community of Blue River (approximately RK 612 to RK 616) (TNRD 2011).
- The proposed pipeline corridor crosses the Alan Creek area, near the Village of Valemount, which is popular for recreational uses such as skiing, hiking, snowmobiling and hunting (approximately RK 550) (BC ILMB 1995).
- Outdoor recreational pursuits, such as hiking and dog walking around Jacko Lake, Coal Hill and River's Trail in Kamloops, are conducted along the proposed pipeline corridor and in the HORU LSA.
- The Kettle Valley Railway, a former railway which was converted into a trail, is crossed by the proposed pipeline corridor at RK 928.1, RK 957.0, RK 970.0 and RK 970.3.
- In the limits of the City of Merritt, there are no recreation uses noted along the proposed pipeline corridor since it is largely private land and farm land (O'Flaherty pers. comm.).
- At the Merritt Community Workshop, it was noted that the existing TMPL right-of-way is used as access for informal camping.
- At the Merritt Community Workshop, it was noted that there is good berry picking in the area near Juliet and July Creeks, near Coldwater River Provincial Park.
- In the Kamloops area, mountain bikers make use of designated trails as well as undesignated trail systems on private ranches (Williams, Morris pers. comm.). Moreover, various urban trails are used for walking, running, cycling and dog walking. Between Merritt and Hope, there are not a lot of recreational uses (Gill pers. comm.).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to outdoor recreational uses in the Fraser-Fort George/Thompson-Nicola Region.

- The right-of-way tenure holders have concerns that summer use may cause degradation to recreational lands that are used predominantly in the winter (Pawliuk pers. comm.).
- Use of the existing TMPL right-of-way has been negotiated through a process with BC MFLNRO and thus it is important to protect established uses (Pawliuk pers. comm.).
- Snow removal for pipeline inspection during operations could disrupt recreational and tourism use of the right-of-way in the Valemount area (Pawliuk pers. comm.).
- Winter backcountry safety was identified as a concern at the Valemount Community Workshop.
- At the Valemount Community Workshop, it was noted that Swift Creek is a popular location for tourists to view salmon spawning.
- Disruption of current use of existing TMPL right-of-way for recreation purposes was identified at the Valemount Community Workshop. It was noted that ATV and horseback riders use the existing TMPL right-of-way.
- Concern regarding new and increased access to hunting areas was identified at the Valemount Community Workshop.

- Access to River Safari (approximately RK 614) during construction was raised as a concern at the Blue River Community Workshop.

- At the Blue River Community Workshop, it was noted that the Red Sands Forest roads are used for snowmobiling.

- Valemount Snowmobile Club recreation areas – North Thompson, Thunder River, Clemina and Adolph Creek – were identified at the Kamloops ESA Workshop.

- The proposed pipeline corridor crosses the property of Mike Wiegele Heli Skiing (MWHS) in the Community of Blue River, which would be disrupted during construction; the property is used in winter for heli-skiing operations as well during summer months for events and highway tourists (Michelle Wiegele pers. comm.).

- The existing TMPL right-of-way is used for recreational purposes (*e.g.,* bike trails) in the District of Clearwater, as identified at the Clearwater Community Workshop.

- Concern regarding disruption and access limitations to Raft River Falls trail was identified at the Clearwater Community Workshop.

- In the HORU RSA, the area south of the District of Barriere, off Fish Trap Creek (multipurpose recreational area), was recently fixed up with work from the Back Country Horsemen (equestrian organization) and would be sensitive to impacts (Williams pers. comm.).

- The importance of clear rules pertaining to the use of the right-of-way for ATVs (Kekula pers. comm.).

- Minimizing disturbances and successful restoration in native grasslands areas, such as the Lac du Bois Grasslands Protected Area, is important (Lishman pers. comm.).

- Any impacts on air quality or freshwater related to spills will impact tourism, given the outdoor recreation focus of tourism in Kamloops (Morris pers. comm.).

- Concern regarding recreational impact in Lac du Bois Grasslands Protected Area, including access to trails and fishing at Deep Lake, was identified at the Kamloops Community Workshop.

- The proposed pipeline corridor crosses the River Safari jet boat company road access (Mike Wiegele pers. comm.).

- Maintaining access for recreational use, including horseback riding and cross-country skiing, was identified at the Merritt Community Workshop.

- Concerns regarding access to the right-of-way for recreational use were identified at the Merritt Community Workshop. It was noted that ATVs have disrupted watercourses near Larson Hill, along the Kettle Valley Railway and along pipeline rights-of-way. Access control in sensitive areas was raised.

There are abundant outdoor recreation use areas throughout the HORU RSA in the region. Local guide and helicopter services (*e.g.,* MWHS operation) take recreationists to mountain areas for skiing. The Clemina Ski Area is located south of the Village of Valemount off the east side of Highway 5, approximately 6 km east of RK 557. Near the City of Kamloops, Stake Lake is a popular site for cross-country skiing and Sun Peaks Mountain Resort offers diverse winter activities including 30 km of groomed trails (Morris pers. comm., Sun Peaks Resort Corporation 2012). Stake Lake is located approximately 7.7 km from RK 870.0 and Sun Peaks Mountain Resort is located approximately 20.7 km from RK 815.0. At the Kamloops Community Workshop, it was identified that the Skull Mountain area, adjacent the District of Barriere, is used for recreational horseback trail and range trails. Near Merritt, snowmobiling is popular along the Coquihalla Highway (Gill pers. comm.). Trails, lodging and camping facilities exist to support recreational activities. It was noted that between Hope and Merritt, there are

many recreational sites along the highway that are not designated by BC MFLNRO or privately operated, but have high occupancy use all year round (Kekula pers. comm.). The sites were established under the *Forest and Range Protection Act* with the intention of expanding facilities; however, this has yet to occur (Kekula pers. comm.). Table B-2 in Appendix B lists parks and protected areas in the HORU RSA in BC.

7.5.5 Outdoor Recreational Use – Fraser Valley Region

Outdoor recreational pursuits, such as hiking, boating and fishing, are conducted along the proposed pipeline corridor and in the HORU LSA in the Fraser Valley Region. The existing TMPL right-of-way is commonly used for recreational purposes in conjunction with other trails (Peters, Johnsrude, Misumi, Fortoloczky pers. comm.).

There are nine provincially designated recreation areas and trails crossed by the proposed pipeline corridor and the HORU LSA in the Fraser Valley Region. Table B-9 in Appendix B provides a list of provincially designated recreation areas and trails along the proposed pipeline corridor and in the HORU LSA in BC. These include the Mt. Henning and 10K Area Snowmobile Trail, the Ogilvie Peak Trail, the Boston Bar Creek Recreation Reserve and the Squeah Recreation Site. Other trails include the District of Hope's network of trails, the Trans Canada Trail, the Chilliwack/Vedder River and numerous undesignated areas along the Coquihalla Highway. The construction of the Coquihalla Highway opened up recreation access to the area (Peters pers. comm.). The Coquihalla Summit Recreation Area is crossed by the proposed pipeline corridor from RK 992.3 to RK 1005.2. The Coquihalla Summit Recreation Area was established to protect the Coast-Cascade Dry belt landscape as well as to provide recreational opportunities such as fishing, hiking, skiing and horseback riding for travellers with access from the Coquihalla highway (BC Parks 2013a). At the Hope Community Workshop, Falls Lake and Needle Peak trail, both located in the Coquihalla Summit Recreation Area, were identified as popular locations for ski touring, snowshoeing and hiking. The proposed pipeline corridor crosses access to Falls Lake at approximately RK 997.4 and crosses Needle Peak trail at approximately RK 1003.0. In the District of Hope, Kawkawa Lake was identified at the Hope Community Workshop as a popular tourism, recreation and fishing location.

Two provincial commercial recreation tenure areas are located in the Fraser Valley Region in the proposed pipeline corridor and the HORU LSA. Table B-10 in Appendix B summarizes commercial recreation tenures along the proposed pipeline corridor and in the HORU LSA in the Fraser Valley Region. The tenure holders, Thompson Rivers University and Reo Rafting Ltd. Guide outfitters, are discussed in Section 7.6.1.5.

Various parks in the proposed pipeline corridor and the HORU LSA offer recreational opportunities including hiking, fishing, boating and camping. Section 7.1.5 provides a description of parks and protected areas encountered by the proposed pipeline corridor and the HORU LSA. Access to Cultus Lake Provincial Park and Cultus Lake Waterpark is crossed by the proposed pipeline corridor. Cultus Lake Waterpark is a regional attraction (Destination BC 2013). The area from the old toll booth on the Coquihalla Highway south is an active recreation area, including: Trans Canada Trail, unauthorized and undesignated recreation and camping areas that are full or busy all summer; few designated trails; and gold panning (Peters pers. comm.). ATV use, motorcycling, hiking, wildlife sightseeing and berry and mushroom picking occurs on various roads and alpine areas within the Coquihalla Landscape Unit (BC ILMB 2004). At the Hope Community Workshop, it was noted that existing rights-of-way (such as the existing TMPL right-of-way, Telus and Spectra) are used for recreation and to access backcountry areas.

Many of the land use and development plans pertinent to the region outline objectives pertaining to outdoor recreation use, as noted below.

Due to the increasing demand of outdoor recreational activities within the district, the Fraser Valley Regional District has developed a Regional Parks Plan, which established new recreational opportunities and minimizes conflict with other land uses (FVRD 2004).

According to the Chilliwack Zoning Bylaw, the proposed pipeline corridor crosses an area zoned as outdoor recreation from approximately RK 1095.6 to RK 1096.6. This zone consists of land that is suitable

for outdoor recreation use for tourists and local residents. The following uses are permitted within this zone: general agriculture, conditional agriculture, outdoor recreation, one family residential, temporary accessory dwelling, boarding, rural ancillary uses, incidental agriculture sales, accessory home occupation, cottage industry and off-street parking (City of Chilliwack 2001).

The proposed pipeline corridor crosses a land use zone labelled as Ledgeview Development Partnership Area (Ledgeview Golf and Country Club) near RK 1119.

Within and near communities in the region, there are a wide range of outdoor recreation areas, some of which are on or near the proposed pipeline corridor, as noted below.

The former Minter Gardens is crossed by the proposed pipeline corridor from approximately RK 1081.1 to RK 1081.5. Minter Gardens closed in October 2013.

In the District of Hope area there are several trails in the area that cross the existing TMPL right-of-way. The proposed pipeline corridor crosses the trailhead for the Hope Mountain Trail in the District of Hope near RK 1045.

In the City of Chilliwack, the Kinkora Golf Course is crossed by the proposed pipeline corridor from approximately RK 1095.9 to RK 1096.7.

In the City of Abbotsford, the Ledgeview Golf and Country Club is crossed by the proposed pipeline corridor from approximately RK 1118.9 to RK 1119.8.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to outdoor recreational uses in the Fraser Valley Region.

- BC MFLNRO identified issues including ATV use, access to rivers exacerbated by a new right-of-way and recreational access between the old toll booth on the Coquihalla Highway and Hope (Peters pers. comm.).
- BC MFLNRO is building recreation sites on either side of a proposed Trans Canada Trail bridge in the vicinity of RK 1029.6 (Peters pers. comm.).
- Re-route areas deviating from the existing TMPL right-of-way may create new corridors for ATV travel which can be seen as a positive and negative (Peters, Johnsrude pers. comm.).
- In the District of Hope, recreational fishers park along the shoulder of Highway 1 near exit 170 to access the sand bar on the south side of the Fraser River. This occurs during summer and is particularly busy during a sockeye year (Misumi pers. comm.).
- At the Hope Community Workshop, it was noted that Othello Road is important access for tourism, in particular to access the Coquihalla Canyon Provincial Park.
- Disruption of the Ledgeview Golf and Country Club during construction was identified as a concern at the Abbotsford Community Workshop.
- Trails and biking areas, such as the Ledgeview mountain biking area and the Trans Canada trail, were identified at the Abbotsford Community Workshop.
- Use of the Sumas River by a rowing club was identified at the Abbotsford Community Workshop.
- Cultus Lake and Chilliwack River were identified as recreation areas and trails at the Surrey ESA Workshop.

Tourism and recreation opportunities are abundant throughout the HORU RSA of the Fraser Valley Region. The Fraser River presents many tourism and recreation opportunities including fishing, rafting and boating (World Web Technologies Inc. 2013). Experience the Fraser is a joint plan to provide land and water-based recreational, cultural and heritage opportunities along the Fraser River. The Concept Plan was developed with participation from Metro Vancouver, the FVRD, the Province, Aboriginal communities, federal agencies, municipalities, NGOs and other groups (Metro Vancouver 2011a). The District of Hope noted the proposal is to build trails on both sides of the Fraser River, using the bridge in Hope as the turnaround point (Misumi pers. comm.). The District of Hope also experiences increased tourism in the summer, much of which is related to outdoor recreation use (*e.g.,* rafting, wildlife viewing) (Fortoloczky pers. comm.);

The region also contains provincial, regional and municipal parks which offer outdoor recreation opportunities such as hiking, boat launches and camping, including the Cheam Wetland Park and Bridal Veils Falls Provincial Park. Activities such as fishing and kayaking, identified at the Chilliwack Community Workshop, occur year round. The Village of Harrison Hot Springs is a tourism destination offering a range of recreational activities including boating, fishing, hiking, golf and wildlife viewing (Tourism Harrison 2013). Table B-2 in Appendix B lists parks and protected areas in the HORU RSA in BC.

7.5.6 Outdoor Recreational Use – Metro Vancouver Region

Outdoor recreational pursuits, such as hiking, cycling and boating, are conducted along the proposed pipeline corridor and in the HORU LSA of the Metro Vancouver Region.

There are numerous recreation sites areas, trails and sites within the proposed pipeline corridor and the HORU LSA. These include the Trans Canada Trail, Burnaby Mountain Conservation Area, and Surrey Bend Regional Park. No provincially designated recreation areas or trails were identified in the proposed pipeline corridor or HORU LSA of the Metro Vancouver Region.

No provincial commercial recreation tenure areas are located in the Metro Vancouver Region in the proposed pipeline corridor or the HORU LSA.

Many of the land use and development plans pertinent to the region outline objectives pertaining to outdoor recreation use, as noted below.

According to the City of Surrey OCP, the proposed pipeline corridor crosses several streets, pathways and overpasses popular for bicycle routes (City of Surrey 2012).

According to the City of Coquitlam Southwest Neighbourhood Plan, the proposed pipeline corridor crosses an area zoned as extensive recreation at approximately RK 1172.6. The Southwest Neighbourhood Plan further describes this as an area for large outdoor recreational uses and limited associated facilities (such as a golf course or sports club) (City of Coquitlam 2001).

According to the City of Burnaby OCP, the proposed pipeline corridor crosses a major trail system (used for walking and cycling) in the City of Burnaby at approximately RK 1178.6 (City of Burnaby 1998).

The Metro Vancouver RGS outlines plans to develop the Metro Vancouver Regional Recreational Greenway Network, which are connections and corridors between Conservation and Recreational Areas within the region (for both recreational and conservation purposes). Although the proposed pipeline corridor crosses these connections, the network is currently conceptual (Metro Vancouver 2010a).

Within and near communities in the region, there are a wide range of outdoor recreation areas, some of which are on or near the proposed pipeline corridor, as noted below.

The Burnaby Mountain Golf Course and Driving Range is located in the HORU LSA approximately 800 m east of RK 1175.6.

The proposed pipeline corridor crosses the Eaglequest Coquitlam Golf Course from RK 1172.3 to RK 1173.1.

Canoeing and kayaking occurs on the Salmon River (Langley Community Workshop).

Various regional and municipal parks in the proposed pipeline corridor and the HORU LSA of the Metro Vancouver Region offer recreational opportunities including hiking, fishing, boating and camping (Section 7.1.6 provides a description of parks in the vicinity of the Project).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to outdoor recreational uses in the Metro Vancouver Region.

- There was discussion with the Township of Langley regarding the use of any future pipeline right-of-way as a greenways trail system (Seifi pers. comm.).
- Stoney Creek and Fraser River were identified as recreation areas and trails at the Surrey ESA Workshop.
- At the Surrey Community Workshop, it was noted that there is a proposed 4 m wide trail (Riverside Greenway) along Surrey Bend Regional Park, and that it is part of the Experience the Fraser Plan.
- It was noted that a boardwalk may be developed along the Fraser River at the Coquitlam Community Workshop.
- It was noted that warning signs along the existing TMPL right-of-way impact cycling use at the Burnaby Community Workshop.
- Mountain biking occurs on Burnaby Mountain in spring, summer and fall (Burnaby Community Workshop).
- Concern regarding dirt bikes and ATVs gaining access to the right-of-way was identified at the Langley Community Workshop.
- Disruption to the Eaglequest Coquitlam Golf Course in the City of Coquitlam was raised as a concern at the Burnaby Community Workshop.

Tourism and recreation opportunities are abundant throughout the HORU RSA of the Metro Vancouver Region; the region is an international tourism destination. Recreational opportunities are accessible in the urban landscape and surrounding areas and range from skiing, golfing and hiking to sailing, kayaking and fishing. Cypress and Mount Seymour provincial parks and Grouse Mountain offer winter activities such as skiing and summer activities such as hiking (Destination BC 2013). Metro Vancouver, and the municipalities it represents, has multiple regional and municipal parks with various recreational opportunities including hiking, cycling and fishing and facilities such as courts, playgrounds and shelters (Metro Vancouver 2011a). The Experience the Fraser Plan, discussed in Section 7.5.5, also applies to the Metro Vancouver Region. Table B-2 in Appendix B lists parks and protected areas in the HORU RSA in BC.

Marine recreational uses located in parts of the Metro Vancouver Region are discussed in Section 7.9.

7.6 Other Land and Resource Uses

This subsection discusses other land and resource uses located in the study areas of each Socio-Economic Region. Other land and resource uses include non-traditional hunting, trapping and fishing; managed forest areas; minerals, aggregates and oil and gas resources; and industrial and commercial use.

7.6.1 Non-traditional Hunting, Trapping and Fishing

This subsection describes hunting, trapping and fishing activities in the study areas of each Socio-Economic Region and presents information related to the applicable hunting regulations. Guide outfitters are also discussed in this subsection.

Effects to traditional use practices associated with hunting will be addressed in the Traditional Land and Resource Use Technical Report (Volume 5D) and in the Socio-Economic ESA (Volume 5B).

Wildlife movement patterns in the HORU RSA are addressed in the Wildlife Technical Report (Volume 5C) and in the Biophysical ESA (Volume 5A).

Hunting, fishing and trapping in Alberta are regulated by AESRD, according to regulations established in Alberta's *Wildlife Act*. Alberta is divided into a series of Wildlife Management Units (WMU) for the purpose of managing wildlife and hunting. Open seasons for big game and game birds are defined for each WMU. Fur Management Zones are established across Alberta with the purpose of managing trapping within Alberta. Trapping regulations in Alberta are zone specific, and open season for small game is defined for each Fur Management Zone. Fish Management Zones are established across Alberta with the purpose of managing fishing within the province.

The BC MFLNRO Fish, Wildlife and Habitat Management Branch regulates hunting, trapping and freshwater fishing activities in BC. For the purpose of efficient management, the Management Unit Regulation under the BC *Wildlife Act* divides the province into nine administrative regions, with a total of 225 management units (MU). Open season for big game, small game, game birds regional regulations are defined for each MU.

7.6.1.1 Non-traditional Hunting, Trapping and Fishing – Edmonton Region

Hunting

Within the Edmonton Region, the proposed pipeline corridor and HORU LSA are located in the Parkland WMU 248 and the Foothills WMU 336 (AESRD 2012b). In general, hunting is prohibited in provincial parks and provincial recreation areas, with the exception of Cooking Lake-Blackfoot Provincial Recreation Area and Fickle Lake Provincial Park. Hunting is permitted in Natural Areas in Alberta, although special management and safety considerations apply in certain areas (Alberta Guide to Hunting Regulations 2013).

For hunting, open season timing varies depending on the WMU and the species, but most hunting occurs from early September to mid-December. Project construction may interact with hunting seasons in this region. Table B-11 in Appendix B summarizes hunting seasons for the WMUs crossed by the proposed pipeline corridor and HORU LSA in Alberta.

Trapping

Within the Edmonton Region, the proposed pipeline corridor and the HORU LSA are located in Fur Management Zones 7 and 4. (AESRD 2012b). Table B-12 in Appendix B summarizes trapping seasons for the Fur Management Zones along the proposed pipeline corridor and in the HORU LSA of Alberta

There are no trapping tenures within the proposed pipeline corridor and HORU LSA in the Edmonton Region (Table B-13 in Appendix B).

Guide Outfitting

There are no guide outfitting tenure holders operating along the proposed pipeline corridor and in the HORU LSA of the Edmonton Region.

Fishing

In Alberta, fishing regulations are zone specific. The proposed pipeline corridor and the HORU LSA of the Edmonton Region are located in Fish Management Zone 2, Watershed Unit Parkland Prairie 2 Zone 2. Rivers in this zone are predominately silty and warm in the summer months (Alberta Guide to Sportfishing Regulations 2012).

There are site-specific regulations for Watershed Unit Parkland Prairie that specify daily catch limits and additional regulations that may be applicable. Common game fish in this zone include yellow perch, northern pike, lake whitefish and walleye (Alberta Guide to Sportfishing Regulations 2012).

There used to be a commercial fishing industry in the Village of Wabamun, but it has recently declined in economic importance (Village of Wabamun 2010).

Named fish-bearing watercourses crossed by the proposed pipeline corridor include Whitemud Creek (RK 28.1) and the North Saskatchewan River (RK 33.5). Table B-14 in Appendix B summarizes the fishing opportunities along the proposed pipeline corridor and in the HORU LSA of the Edmonton Region.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to non-traditional fishing in the Edmonton Region.

Refer to the Fisheries (Alberta) Technical Report in Volume 5C for more detail on fish and fish habitat.

7.6.1.2 Non-traditional Hunting, Trapping and Fishing – Rural Alberta Region

Hunting

Within the Rural Alberta Region, the proposed pipeline corridor and the HORU LSA are located in Foothills WMUs 336, 337, 338, 340, 342, 344, 346 and 348 and the Mountain WMU 438 (AESRD 2012b). In general, hunting is prohibited in provincial parks and provincial recreation areas. Hunting is permitted in Natural Areas in Alberta, although special management and safety considerations apply in certain areas (Alberta Guide to Hunting Regulations 2013).

For hunting, open season timing varies depending on the WMU and the species, but most hunting occurs from early September to mid-December. Project construction may interact with hunting seasons in this region. Table B-11 in Appendix B summarizes hunting seasons for the WMUs along the proposed pipeline corridor and in the HORU LSA in Alberta.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), no issues were identified with respect to non-traditional hunting in the Rural Alberta Region.

Trapping

Within the Rural Alberta Region, the proposed pipeline corridor and the HORU LSA are located in Fur Management Zones 4 and 5 (AESRD 2012b). Table B-12 in Appendix B summarizes trapping seasons for the Fur Management Zones along the proposed pipeline corridor and in the HORU LSA in Alberta.

There are 19 registered trapping tenures crossed by the proposed pipeline corridor and HORU LSA in the Rural Alberta Region. Trapping seasons vary depending on species, but generally occur from early October to late April (Alberta Guide to Trapping Regulations 2013). Table B-13 of Appendix B summarizes the registered trapping areas along the proposed pipeline corridor and in the HORU LSA in Alberta.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to non-traditional trapping in the Rural Alberta Region.

Guide Outfitting

There are no guide outfitters operating along the proposed pipeline corridor and in the HORU LSA of the Rural Alberta Region.

Fishing

The proposed pipeline corridor and the HORU LSA of the Rural Alberta Region are located in Fish Management Zone 1 and Watershed Unit Eastern Slopes 3. Zone 1 consists of tributary creeks that flow into larger streams. Waterbodies from the mountains and foothills are typically clear and cold (Alberta Guide to Sportfishing Regulations 2012).

There are site-specific regulations for Watershed Unit Eastern Slopes 3 that specify daily catch limits and additional regulations that may be applicable. Common game fish in this zone include Arctic grayling, bull trout, rainbow trout, mountain whitefish and pike (Alberta Guide to Sportfishing Regulations 2012).

Named fish-bearing watercourses crossed by the proposed pipeline corridor include the Pembina River (RK 135.5) and McLeod River (RK 223.9). Table B-14 in Appendix B summarises the fishing opportunities along the proposed pipeline corridor and in the HORU LSA of the Rural Alberta Region.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to non-traditional fishing in the Rural Alberta Region.

Refer to the Fisheries (Alberta) Technical Report in Volume 5C for more detail on fish and fish habitat.

7.6.1.3 Non-traditional Hunting, Trapping and Fishing – Jasper National Park Region

Non-traditional hunting and trapping is prohibited in National Parks. Firearms are prohibited in National Parks except on highways and in town sites where they must be unloaded and encased (Alberta Guide to Hunting Regulations 2013). Fishing in National Parks requires a valid National Park Fishing Permit, available at most park facilities and some commercial outlets. Provincial licenses are not valid inside National Parks (Alberta Guide to Sportfishing Regulations 2012).

Commercial fishing activity in Jasper National Park occurs primarily on Maligne Lake, outside of the HORU LSA. Three commercial operators provide guided fishing on Maligne Lake. Commercial use on other streams and rivers in Jasper National Park is limited (TERA Environmental Consultants 2005).

7.6.1.4 Non-traditional Hunting, Trapping and Fishing – Fraser-Fort George/Thompson-Nicola Region

Hunting and Trapping

The Fraser-Fort George/Thompson-Nicola Region crosses Resource Management Region 7A (Omineca) from approximately RK 489.6 to RK 548.1 and Resource Management Region 3 (Thompson-Nicola) from RK 548.1 to RK 991.3. The proposed pipeline corridor is located in BC MUs Upper Fraser (7-2, 7-3, 7-4), North Thompson (3-43, 3-44, 3-40, 3-41, 3-39), Bonaparte (3-28, 3-29) and Nicola (3-19, 3-12, 3-13).

For hunting, open season timing varies depending on the MU and the species, but most hunting occurs from early September to March. Project construction may interact with hunting seasons in this region. Table B-15 in Appendix B summarises the hunting and trapping seasons for the MUs along the proposed pipeline corridor and in the HORU LSA in the Fraser-Fort George/Thompson-Nicola Region. There are also recreational hunting opportunities within the Blue River area (TNRD 2011).

There are 35 registered trapline holders within the proposed pipeline corridor and HORU LSA of the Fraser-Fort George/Thompson-Nicola Region. Table B-16 of Appendix B summarises the registered trapping areas along the proposed pipeline corridor and in the HORU LSA of the Fraser-Fort George/Thompson-Nicola Region. Most trapping seasons occur from October to late April, with some extending to May, and will overlap with Project construction spreads BC1 and BC2 (*i.e.,* summer and

winter construction seasons). Table B-15 in Appendix B summarises trapping seasons for MUs along the proposed pipeline corridor and in the HORU LSA in the Fraser-Fort George/Thompson-Nicola Region.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to non-traditional hunting and trapping in the Fraser-Fort George/Thompson-Nicola Region.

- At the Blue River Community Workshop, it was noted that traplines are active near Finn Creek.
- At the Merritt Community Workshop, concerns regarding impacts of increased or new access to previously inaccessible areas would result in poaching and hunting in special wildlife habitat areas were identified.

Guide Outfitting

The BC MFLNRO Fish, Wildlife and Habitat Management Branch regulates guide outfitters in BC. All non-residents are required to be accompanied by a licensed guide while hunting big game (*i.e.,* deer, mountain sheep, mountain goat, moose, caribou, elk, cougar, wolf, grizzly bear, black bear, lynx, bobcat and wolverine). Guides are not required while hunting small game (*i.e.,* game birds, migratory game birds, fox, raccoon, coyote, skunk and hare) (BC MOE 2010).

There is one guide outfitter operating along the proposed pipeline corridor of the Fraser-Fort George/Thompson-Nicola Region. There are no additional guide outfitters located in the HORU LSA.

Table B-17 in Appendix B summarizes guide outfitter operations in the proposed pipeline corridor and in the HORU LSA of the Fraser-Fort George/Thompson-Nicola Region.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to non-traditional hunting in the Fraser-Fort George/Thompson-Nicola Region.

Fishing

Named fish-bearing watercourses crossed by the proposed pipeline corridor in the Fraser-Fort George/Thompson-Nicola Region include the Fraser River, North Thompson River, Clearwater River, Thompson River, Nicola River and Coldwater River, among others. The Fisheries (British Columbia) Technical Report of Volume 5C provides fish-bearing information on all proposed watercourse crossings.

Provincial regulations regulate freshwater recreational fishing using the same Resource Management Regions and BC MUs as hunting and trapping. Freshwater recreational fishing regulations vary depending on Resource Management Region. In the Omineca (7A) Resource Management Region, spring closure is from April 1 to June 30, whereas spring closure in the Thompson-Nicola (3) Resource Management Region is from January 1 to June 30 (BC MFLNRO 2013b). Table B-18 in Appendix B summarises fishing opportunities and water-specific exceptions to regional regulations along the proposed pipeline corridor and in the HORU LSA of the Fraser-Fort George/Thompson-Nicola Region.

Common recreational fish species in watercourses crossed by the proposed pipeline corridor in the Fraser-Fort George/Thompson-Nicola Region include rainbow trout, bull trout, Dolly Varden, whitefish and salmon species (Backroad Mapbooks 2009). Recreational lake fishing opportunities in the HORU LSA (Table B-18 in Appendix B) include Dutch Lake, Lemieux Lake and Jacko Lake. Common recreational fish species are rainbow and brook trout (Backroad Mapbooks 2009). It was noted at the Kamloops Community Workshop that ice fishing is popular at many lakes near the City of Kamloops.

Lakes with recreational fishing values exist in the HORU RSA and include: Kinabasket Lake, Surprise Lake, Round Lake, Jewel Lake, TumTum Lake, Adams Lake, Star Lake, Lolo Lake, Dum Lake, Dunn Lake, Thuya Lakes, Noble Lake, Isobel Lake, Heffley Lakes, Kamloops Lake, Lac Le Jeune, Roche Lake, Stump Lake and Nicola Lake, among many others.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to non-traditional fishing in the Fraser-Fort George/Thompson-Nicola Region.

- Concerns regarding disruption and maintenance of access were identified at the Clearwater Community Workshop, in particular to Man Lake, Dum Lake, Eakin Creek, Darlington Creek and Thuya Creek.

- The Kamloops area attracts tourists for fly-fishing (Morris pers. comm.).

7.6.1.5 Non-traditional Hunting, Trapping and Fishing – Fraser Valley Region

Hunting and Trapping

The Fraser Valley Region crosses Resource Management Region 2 (Lower Mainland) from RK 991.3 to RK 1137.4. The proposed pipeline corridor is located in BC MUs Fraser Valley (2-17, 2-2, 2-3 and 2-4).

For hunting, open season timing varies depending on the MU and the species, but most hunting occurs from early September to March. Project construction is not expected to interact with hunting seasons in this region. Table B-15 in Appendix B summarises the hunting and trapping seasons for the MUs along the proposed pipeline corridor and in the HORU LSA of the Fraser Valley Region.

The Fraser Valley Special Hunting Area is located in MU 2-4 and the portions of MU 2-8 which are located in Coquitlam, Mission, Maple Ridge and Pitt Meadows. In certain areas of the cities of Chilliwack and Abbotsford, the discharge of firearms is prohibited by municipal bylaws. For example, the use of firearms are prohibited on Sumas Mountain (BC MFLNRO 2012b). Recreational hunting (particularly deer and bears) is popular within the Coquihalla Landscape Unit (BC ILMB 2004). It was noted that hunting does not occur on the valley floor in Chilliwack, but rather in the hillside area southeast of the city (Stanton, Sanderson pers. comm.).

Near residential dwellings, hunting is prohibited. The following restrictions exist in the MUs along the proposed pipeline corridor.

Hunters in the Fraser Valley Special Licence Hunting Area (MUs 2-4 and portions of 2-8) must purchase a Fraser Valley Special Area Hunting Licence in addition to other licences. A $1 million public liability and property damage insurance is required (BC MFLNRO 2012b).

There is a No Shooting Area near Hope in MUs 2-2 and 2-17 (BC MFLNRO 2012c).

There is a No Shooting Area in the Popkum area in MU 2-3 (BC MFLNRO 2012c).

There is a Firearms Using Shot Only Area in the Chilliwack Valley in MU 2-3 (BC MFLNRO 2012c).

There are eight registered trapline holders crossed by the proposed pipeline corridor and the HORU LSA in the Fraser Valley Region. Table B-16 of Appendix B summarizes the registered trapping areas along the proposed pipeline corridor and in the HORU LSA of the Fraser Valley Region. Most trapping seasons occur from October to March and will overlap with Project construction in the region (*i.e.,* summer and winter construction seasons). Table B-15 in Appendix B summarizes trapping seasons for the MUs along the proposed pipeline corridor and in the HORU LSA of the Fraser Valley Region.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to non-traditional hunting and trapping in the Fraser Valley Region.

Guide Outfitting

There are two guide outfitters operating along the proposed pipeline corridor of the Fraser Valley Region. There are no additional guide outfitters located in the HORU LSA.

Table B-17 in Appendix B summarises guide outfitter operations in the proposed pipeline corridor and in the HORU LSA of the Fraser Valley Region.

Fishing

Named fish-bearing watercourses crossed by the proposed pipeline corridor in the Fraser Valley Region include the Coquihalla River, Chilliwack/Vedder River and Sumas River, among others. The Fisheries (British Columbia) Technical Report of Volume 5C provides fish-bearing information on all proposed watercourse crossings. Provincial regulations regulate freshwater recreational fishing using the same Resource Management Regions and BC MUs as hunting and trapping. Freshwater recreational fishing regulations vary depending on Resource Management Region. In the Lower Mainland (2) Resource Management Region, there are restrictions to steelhead fishing (BC MFLNRO 2013b). Table B-18 in Appendix B summarises fishing opportunities and water-specific exceptions to regional regulations along the proposed pipeline corridor and in the HORU LSA of the Fraser Valley Region.

Common recreational fish species in watercourses crossed by the proposed pipeline corridor in the Fraser Valley Region include Dolly Varden, cutthroat trout, steelhead and salmon species (Backroad Mapbooks 2009, 2010). Recreational lake fishing opportunities in the HORU LSA (Table B-18 in Appendix B) include Coquihalla Lakes, Kawkawa Lake and Sardis Pond. Common recreational fish species are rainbow and cutthroat trout (Backroad Mapbooks 2009, 2010). Kawkawa Lake is a popular fishing destination, particularly for Kokanee and cutthroat trout (BC ILMB 2004, Tourism Chilliwack 2013). It was noted at the Merritt Community Workshop that ice fishing is popular at the Coquihalla Lakes.

In the District of Hope, recreational fishers park along the shoulder of Highway 1 near exit 170 to access the sand bar on the south side of the Fraser River. This occurs during summer and is particularly busy during a sockeye year (Misumi pers. comm.).

The Chilliwack/Vedder River crossing was raised as an issue by the City of Chilliwack, particularly with reference to fisheries concerns due to the presence of salmon habitat (Blain pers. comm.). The Chilliwack Vedder River Cleanup Society has been instrumental in maintaining the river and has completed environmental work (Blain pers. comm.). The Chilliwack/Vedder River is a popular fishing location in the Lower Mainland for steelhead, Chinook salmon, coho salmon, rainbow trout, cutthroat trout, Dolly Varden, char and Rocky Mountain whitefish (Tourism Chilliwack 2013). Fishing on the Chilliwack/Vedder River is busy on both sides of the river at peak season (Friesen, Stanton pers. comm.).

Lakes with recreational fishing values exist in the HORU RSA, and include, Falls Lake, Deer Lake (Sasquatch Park), Hicks Lake, Wahleach Lake, Harrison Lake, Cultus Lake and Mill Lake, among many others.

7.6.1.6 Non-traditional Hunting, Trapping and Fishing – Metro Vancouver Region

Hunting and Trapping

The Metro Vancouver Region crosses Resource Management Region 2 (Lower Mainland) from RK 1137.4 to RK 1180.6. The proposed pipeline corridor is located in BC MUs Fraser Valley (2-4 and 2-8).

The Fraser Valley Special Hunting Area is located in MU 2-4 and the portions of MU 2-8 which are located in Coquitlam, Mission, Maple Ridge and Pitt Meadows. In the City of Burnaby and most of the City of Coquitlam, the discharge of firearms is prohibited by City Bylaw (BC MFLNRO 2012b). In the City of Coquitlam, there is an area along the banks of the Pitt River where the use of firearms are permitted, but cannot be discharged towards the shore (BC MFLNRO 2012b). The City of Surrey and the Township of Langley do not permit general discharge of firearms for hunting; however, in agriculturally zoned lands, the discharge of firearms is permitted year-round to protect crops, livestock and farm lands. During spring and summer seasons, specific permits are required (BC MFLNRO 2012b). The Langley Discharge of Firearms Bylaw prohibits the use of longbows and crossbows and the City of Coquitlam Discharge of Firearms Bylaw prohibits the use of archery (BC MFLNRO 2012b).

Open season hunting timing varies depending on the MU and the species, but most hunting occurs from early September to March. Project construction is not expected to interact with hunting seasons in this region. Table B-15 in Appendix B summarises the hunting and trapping seasons for the MUs along the proposed pipeline corridor and in the HORU LSA of the Metro Vancouver Region.

Hunting is prohibited near residential dwellings. Hunters in the Fraser Valley Special Licence Hunting Area (MUs 2-4 and portions of 2-8) must purchase a Fraser Valley Special Area Hunting Licence in addition to other licences. A $1 million public liability and property damage insurance is required (BC MFLNRO 2012b).

There are no registered trapline holders within the HORU RSA in the Metro Vancouver Region. Table B-15 in Appendix B summarizes trapping seasons for the MUs along the proposed pipeline corridor and in the HORU LSA of the Metro Vancouver Region.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to non-traditional hunting and trapping in the Metro Vancouver Region.

Guide Outfitting

There are no registered guide outfitters located along the proposed pipeline corridor or in the HORU LSA of the Metro Vancouver Region.

Fishing

Named fish-bearing watercourses crossed by the proposed pipeline corridor in the Metro Vancouver Region include the Salmon River and Fraser River, among others. The Fisheries (British Columbia) Technical Report of Volume 5C provides fish-bearing information on all proposed watercourse crossings. Provincial regulations regulate freshwater recreational fishing using the same Resource Management Regions and BC MUs as hunting and trapping. Freshwater recreational fishing regulations vary depending on Resource Management Region. In the Lower Mainland (2) Resource Management Region, there are restrictions to steelhead fishing (BC MFLNRO 2013b). Table B-18 in Appendix B summarises fishing opportunities and water-specific exceptions to regional regulations along the proposed pipeline corridor and in the HORU LSA of the Metro Vancouver Region. Recreational fishing on the Salmon River was noted at the Langley Community Workshop.

Common recreational fish species in watercourses crossed by the proposed pipeline corridor in the Metro Vancouver Region include Dolly Varden, cutthroat trout, steelhead, sturgeon and salmon species (Backroad Mapbooks 2010). No recreational lake fishing opportunities were identified in the HORU LSA in the Metro Vancouver Region. It was noted that there is sportfishing access north of the Barnston Ferry at the Surrey Community Workshop.

In Surrey, the CN lines along the Fraser River keep people away from potential fishing locations, however some fishing occurs under the Patullo Bridge (Baron pers. comm.). In the City of Burnaby, the Brunette River is located in the HORU LSA. The Brunette River has fishing opportunities for cutthroat trout and stocked steelhead (Backroad Mapbooks 2010).

One of the few lakes with recreational fishing values located in the municipalities in the HORU RSA of the Metro Vancouver Region is Deer Lake in the City of Burnaby. See the Marine Commercial, Recreational and Tourism Use – Marine Transportation Technical Report of Volume 8B for a full discussion of marine, commercial, recreational and tourism use.

7.6.2 Managed Forest Areas

This subsection provides a high-level overview of various managed forest areas that occur along the proposed pipeline corridor. This includes timber management areas, Crown tenures other forestry-related tenures, and in BC only, Old Growth Management Areas (OGMA). A total of 66 OGMAs are crossed by the proposed pipeline corridor (42 are legal OGMAs and 24 are non-legal OGMAs).

Refer to the Managed Forest Areas and Forest Health Technical Report of Volume 5D for a full discussion of managed forest areas in relation to the Project.

7.6.2.1 Managed Forest Areas – Edmonton Region

The proposed pipeline corridor and the HORU LSA of the Rural Alberta Region are located in the WO2 Forest Management Unit.

There are no timber tenure agreements crossed by the proposed pipeline corridor in the Edmonton Region. There are no records of noteworthy forest health factors within the Edmonton Region. Isolated pockets of light levels of Bruce spanworm defoliation were recorded in 2009. Most of this region is non-forested.

The City of Spruce Grove has an Urban Forest Management Plan, which identifies biodiversity of forest stands within its boundaries and potential threats (City of Spruce Grove 2010).

7.6.2.2 Managed Forest Areas – Rural Alberta Region

The proposed pipeline corridor and the HORU LSA of the Rural Alberta Region are located in the WO1, WO2, E2, E1, E9, E14, and H1 Forest Management Units.

There are two potentially affected timber tenure agreements in the Rural Alberta Region: West Fraser Mills (Hinton) and Weyerhaeuser Company Ltd. (Pembina Timberland). Additionally, six forest grazing leases were identified.

In 2008 and 2012 the most prominent forest health factor within the Rural Alberta Region was mountain pine beetle. Pine beetle mortality occurred between RK 135.0 and RK 339.4. Southwest of Wolf Pump Station and southeast of the Town of Edson; south of Highway 16, mountain pine beetle mortality has been most extensive. Overall, 2010 mortality was greater than observed in 2012.

The proposed pipeline corridor crosses through Cache Percotte Forest from approximately RK 316 to RK 325. Although most of this forest is located outside of Town of Hinton municipal boundaries, the small portion that is located within the town is used in part with the Environmental Training Centre and Foothills Model Forest Program for environmental awareness and education (Town of Hinton 1998)

7.6.2.3 Managed Forest Areas – Jasper National Park Region

There are no timber tenure agreements crossed by the existing TMPL right-of-way or Jasper Pump Station in the Jasper National Park Region.

7.6.2.4 Managed Forest Areas – Fraser-Fort George/Thompson-Nicola Region

The proposed pipeline corridor and the HORU LSA of the Fraser-Fort George/Thompson-Nicola Region are located in the Kamloops and Cascades Forest Districts and in the boundaries of the Robson Valley TSA, the Kamloops TSA and the Merritt TSA.

The Robson Valley TSA covers approximately 1.24 million hectares and includes the communities of McBride, Dunster, Valemount and Crescent Spur. The Robson Valley TSA is administered by the Prince George Forest District (BC MFLNRO 2011a).

The Kamloops TSA covers 2.77 million ha. Forests in the district consist mainly of stands of Douglas-fir and lodgepole pine, with spruce and subalpine fir in a diverse landscape consisting of grasslands, lakes, wetlands, forests and alpine areas (BC Ministry of Forests and Range [MOFR] 2008). Approximately 1,479,005 million ha (53%) of the Kamloops TSA are considered productive forest area. A 2008 TSA timber analysis assumed that approximately 45% of productive forest is considered available for timber production. As of June 1, 2008, the Annual Allowable Cut (AAC) for the Kamloops TSA was 4,000,000 m^3, which is a decrease of approximately 8.1% from 2004 (BC MOFR 2008).

The Merritt TSA covers 1.13 million ha. Forests in the district consist mainly of stands of pine and Douglas-fir in a landscape consisting of warm and dry ecosystems, cool and wet forests, mountainous forests and alpine areas (Forsite 2010). Approximately 803,558 ha (71%) of the Merritt TSA are considered productive forest area. A 2010 TSA timber analysis assumed that approximately 78% of productive forest is considered available for timber production. As of December 2, 2010, the AAC for the Merritt TSA was 2,400,000 m^3, which is a decrease of approximately 14.7% from 2005 (BC Ministry of Forests, Mines and Lands 2010).

In the region, there are 58 legal and non-legal OGMAs crossed by the proposed pipeline corridor. Of these, 38 may require compensation in terms of location of replacement areas that are equivalent in size to the area disturbed, located in the same BGC subzone and/or variant, and a review of the ecological attributes and function of the replacement areas. OGMAs are primarily located in the Cascade Forest District which is in the southern section of this region.

There are an estimated 13 forestry licensees within the Kamloops Headwaters Forest District and the Cascades Forest District. Of these, four are woodlot operators.

The most prominent forest health factor across this region has been mountain pine beetle, which has affected over 300,000 ha over the past five years. Severity has generally ranged from trace to extreme and damage peaked in 2008. Other major forest health factors include balsam bark beetle, Douglas-fir bark beetle, western spruce budworm and aspen leaf miner. In the Headwaters Forest District, Douglas-fir bark beetle populations had shown a drastic decrease in extent and severity of damage as of 2011 but substantially increased in 2012. In the Kamloops Forest District, Douglas-fir bark beetle damage showed an increase from 2011 to 2012. The Kamloops Forest District and Cascades Forest District areas have historically had extensive damage associated with western spruce budworm. However, budworm-induced damage in the Kamloops District has generally decreased over the past five years and forests showed no recorded damage as of 2012. Although budworm activity has been recorded in the Cascades Forest District, there has been no increase or decrease in damage since 2008.

Land use and development plans outline a range of objectives and use areas pertaining to forestry, as noted below.

The Robson Valley LRMP outlines several objectives for forestry management, such as establishing Forest Ecosystem Networks (and include unmerchantable forested areas), establishing Forest Land Reserves (outside of ALR) and maintaining Old Growth Areas (BC ILMB 1999).

The Eight Peaks SRMP promotes integral management to optimize economic and social benefits, while minimizing timber loss within winter recreational areas (BC ILMB 2002).

The forests in the Blue River OCP area are part of the Interior Cedar Hemlock (a very productive forest zone in the province) and thus the forest industry plays an important economic role for Blue River. Logging has been a sensitive issue for local residents, who are now in the process of establishing Visual Quality Objectives for the Plan Area based on the disruption of forested areas (TNRD 2011).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues and concerns were identified with respect to forestry in the Fraser-Fort George/Thompson-Nicola Region.

- Continued access to forestry areas and timber will be important during the Project (Williams, Lishman pers. comm.).
- Opportunities during Project construction to remove areas of dead trees identified in TNRD wildfire protection plans (Storie pers. comm.).
- Mountain pine beetle damage in the Blue River area was noted at the Blue River Community Workshop.

- Compensation for woodlot tenure holders (Williams pers. comm.).

7.6.2.5 Managed Forest Areas – Fraser Valley Region

The proposed pipeline corridor and the HORU LSA of the Fraser Valley Region are located in the Chilliwack Forest District and in the boundaries of the Fraser TSA.

The Fraser TSA covers 1.4 million ha. Forests in the district consist mainly of the Coastal Western Hemlock Zone, in addition to 13 commercial tree species in a diverse landscape consisting of 5 biogeoclimatic zones (BC Ministry of Forests [MOF] 2004). Approximately 636,675 ha (44.8%) of the Fraser TSA are considered productive forest area. A 2004 TSA timber analysis assumed that approximately 41% of productive forest is considered available for timber production. As of August 1, 2004 the AAC for the Fraser TSA was 1,270,000 m^3, which maintains the 1999 AAC (BC MOF 2004).

Within the Fraser Valley Region, there are eight legal and non-legal OGMAs crossed by the proposed pipeline corridor, four of which may require compensation. OGMAs are located primarily in the Cascade Forest District. This region primarily includes licensees from the Chilliwack Forest District with the northern edge of the region intersecting Tolko Industries Ltd. from the Kamloops Forest District. Licensees include Bill 28, BC Timber Sales, Teal Cedar Products and Hope Community Forest.

There are no major forest health factors of concern in the Fraser Valley Region. Mountain pine beetle is active throughout the eastern section of this region; however, populations are generally on the decline and more recent mapped incidences (2011) are small to medium-sized polygons (1–55 ha) of trace to moderate severity (1–55 ha) with no mapped damage as of 2012. The only potential issue for this region will be Douglas-fir bark beetle activity which could be a problem with accumulating dead Douglas-fir.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues and concerns were identified with respect to forestry.

- BC MFLNRO identified that any restriction to access for forestry is an issue (Johnsrude pers. comm.); many roads in the region are load bearing and industrial use cannot be restricted.
- Forestry users will need to be consulted; forestry will want continual access to timber (Lishman pers. comm.).
- The forestry industry is sensitive to removing available land base (Johnsrude pers. comm.).
- The District of Hope was interested in the timber salvage (Fortoloczky pers. comm.).
- Permits from BC MFLNRO will be required (timber harvesting, FSR access) (Drysdale pers. comm.).
- There are some OGMAs being established in the general area, but conflict with the existing TMPL right-of-way is unlikely (Drysdale pers. comm.).

7.6.2.6 Managed Forest Areas – Metro Vancouver Region

This region is within the BC MFLNRO Chilliwack Forest District, but within the region the Project does not encounter any potentially affected timber licensees. There are no OGMAs in the Metro Vancouver Region. The only forest health factor of importance in this region is the Douglas-fir bark beetle which was mapped in the Capilano, Seymour, Indian Arm areas between 2008 and 2012. More recent damage includes single polygons of moderate size and severity. Considering the location of these incidences, there are no likely forest health concerns with respect to Project.

7.6.3 Minerals, Aggregates, and Oil and Gas Resources

This subsection discusses mineral, aggregates and oil and gas resource use areas that are along or near the proposed pipeline corridor. Overall, in Alberta the proposed pipeline corridor, and TMPL right-of-way through Jasper National Park, directly crosses three mineral tenures and seven excavation pits from

which gravel, sand or clay are removed. In BC the proposed pipeline corridor crosses 15 excavation pits from which gravel, sand or clay are removed. In addition, in BC, 282 mineral claims, 5 placer claims, 1 coal license, 2 coal applications and 1 mineral lease are located in the proposed pipeline corridor and HORU LSA.

7.6.3.1 Minerals, Aggregates and Oil and Gas Resources – Edmonton Region

Provincial authorities and policies outline the right to protect, extract and produce resources such as oil, gas, sand and gravel, and also protect such activities from inappropriate urban activities (City of Edmonton 2010).

Minerals

Mining activities occur in the HORU RSA in the Edmonton Region, but are not as abundant as in other areas of Alberta. One active mineral tenure, from RK 97.5 to RK 99.2, is found in the proposed pipeline corridor and the HORU LSA of the Edmonton Region. Table B-19 in Appendix B summarizes mineral tenures along the proposed pipeline corridor and in the HORU LSA of the Edmonton Region.

The proposed pipeline corridor crosses TransAlta's Whitewood Coal Mine from RK 104.4 to RK 105.0. The Whitewood Coal Mine ceased operations in 2010 after the closure of the TransAlta Utilities Corporation Wabamun Generating Plant and the site is being reclaimed (TransAlta 2012).

Aggregates

The proposed pipeline corridor crosses four excavation pits from which gravel, sand or clay are removed in the Edmonton Region. Six additional excavation pits are crossed by the HORU LSA in the region (Table B-19 in Appendix B).

Oil and Gas

There is extensive oil and gas activity in the Edmonton Region, including oil and gas production, petroleum upgrading and refining, and pipelines. Three of Canada's 19 oil refineries are located in the region; Shell, Imperial Oil and Suncor produce approximately 22% by volume of Canada's petroleum products in the region (City of Edmonton 2013). Canada's largest oil refining complex is located in Strathcona County. The Strathcona County MDP encourages expansion and diversification of existing petrochemical complexes (Strathcona County 2007).

While oil and gas production occurs in many areas throughout the region, areas of concentrated activity include areas near the Town of Devon, the Town of Drayton Valley, and rural areas of Parkland County between the City of Edmonton and the City of Spruce Grove. The Parkland County MDP states that AER subdivision and setback regulations for oil and gas facilities will be adhered to when considering further development (Parkland County 2007).

The proposed pipeline corridor crosses oil and gas pipelines 161 times in the Edmonton Region. Clusters of pipelines are crossed from approximately RK 0.0 to RK 8.5, RK 21.1 to RK 25.3 and RK 40.2 to 48.9. Pipeline operators include Atco Gas and Pipelines Ltd., Pembina Pipeline Corporation, Plains Midstream Canada ULC and Penn West Petroleum Ltd (IHS Inc. 2013b).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), no issues were identified with respect to minerals, aggregates and oil and gas resources in the Edmonton Region.

7.6.3.2 Minerals, Aggregates and Oil and Gas Resources – Rural Alberta Region

Minerals

The Rural Alberta Region is located in an area of high metallic and industrial mineral potential. Minerals and aggregates, including coal, clay, sand and gravel, oil and natural gas, traditionally formed the basis for economic activity in the Town of Edson and the Town of Hinton. In recent years, forestry, agriculture and tourism have become important economic drivers in the towns and surrounding area. Many

communities in the HORU RSA of the Rural Alberta Region emerged as a result of mining. Coal mining still plays an important role in the economy of the region (Alberta Community Profiles 2013).

Current and proposed mines in the HORU RSA include the Coal Valley Resources Inc. Robb Trend Project which is a proposed extension to the existing mining and coal processing activities at Coal Valley Mine (approximately 40 km southeast of Hinton) and the proposed Coalspur Mines Ltd. Vista Coal Mine Project.

Two active mineral tenures are crossed by proposed pipeline corridor and the HORU LSA of the Rural Alberta Region. Athabasca Minerals Inc. (RK 310.5 to RK 318.9) has a mineral tenure in the proposed pipeline corridor. Table B-19 in Appendix B summarizes mineral and aggregate tenures along the proposed pipeline corridor and in the HORU LSA of the Rural Alberta Region.

The Yellowhead County MDP opposes any new resource extraction activities within 1.5 km of existing residential development. The Yellowhead County MDP does, however, recognize that any authorization given by the NRCB or the AER prevails over this policy. Furthermore, the Yellowhead County MDP acknowledges that AER setback regulations and guidelines must be applied for future development (Yellowhead County 2006).

Aggregates

The proposed pipeline corridor does not cross any excavation pits from which gravel, sand or clay are removed in the Rural Alberta Region. However, the HORU LSA crosses five known excavation pits (Table B-19 in Appendix B).

Oil and Gas

The proposed pipeline corridor crosses oil and gas pipelines 219 times in the Rural Alberta Region. Clusters of pipelines are crossed from approximately RK 135.6 to RK 137.2, RK 151.6 to RK 165.6, RK 192.5 to RK 203.8, RK 240.1 to RK 258.1 and RK 302.2 to RK 311.2. Pipeline operators include Atco Gas and Pipelines Ltd., Terasen Inc., Talisman Energy Inc., Compton Petroleum Corporation and Nova Gas Transmission Ltd (IHS Inc. 2013b).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement the following issues were identified with respect to minerals, aggregates and oil and gas resources in the Rural Alberta Region.

- Concern was raised at the Edson Community Workshop regarding potential timing overlap of construction of the Project and the proposed Vista Coal Project.

7.6.3.3 Minerals, Aggregates and Oil and Gas Resources – Jasper National Park Region

According to the Jasper National Park of Canada Management Plan, the Municipality of Jasper has plans to develop a long-term aggregate management strategy, considering requirements for road construction and maintenance and the restoration of disturbed areas. The strategy will permit the material to be acquired from inside the park, will prohibit gravel extraction in important habitats, places of cultural value or aesthetic importance and will ensure restoration of existing and new gravel sources (Parks Canada 2010).

There are three active gravel pits located in Jasper National Park. These pits provide gravel for maintenance and resurfacing within the park and, including planned expansions, will serve the park for 15 years (Parks Canada 2010). There are no active mineral or aggregate tenures in the existing TMPL right-of-way in the Jasper National Park Region.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), no issues were identified with respect to minerals, aggregates and oil and gas resources in the Jasper National Park Region.

7.6.3.4 Minerals, Aggregates and Oil and Gas Resources – Fraser-Fort George/Thompson-Nicola Region

Minerals

The Fraser-Fort George/Thompson-Nicola Region is located in areas of high metallic mineral and mineral potential. There are 210 active mineral claims, 7 placer claims, 1 coal licence and 2 coal applications crossed by the proposed pipeline corridor and the HORU LSA of the Fraser-Fort George/Thompson-Nicola Region. The highest concentration of active mineral tenures is found at approximately RK 500.0, RK 578.0, RK 600.0, RK 700.0, RK 758.0, RK 853.4 and RK 879.6. Table B-20 in Appendix B summarizes mineral and aggregate tenures along the proposed pipeline corridor and in the HORU LSA of the Fraser-Fort George/Thompson-Nicola Region.

According to the Robson Valley LRMP, mining (especially quarry and aggregate resources) is encouraged within the Settlement/Agriculture RMZ in order to increase local employment. The Eight Peaks SRMP supports mineral exploration as long as it supports winter recreational activities/areas (BC ILMB 2002).

According to the TNRD Fringe Areas Policy, consideration will be given to extractive industries that might be located in the fringe area due to specific location requirements (TNRD 2012). The TNRD RGS states that the current resource industry must be protected and expanded through the proper consultative processes. It also encourages new economic development that adheres to social, environmental, sustainable and aesthetic objectives (TNRD 2000). This plan does not specify any restrictions or considerations pertaining to pipeline construction with regard to extractive industries.

According to the Kamloops LRMP, the proposed pipeline corridor crosses areas of high metallic mineral potential (from approximately RK 686 to RK 769). The proposed pipeline corridor also crosses an area of high industrial mineral potential (from approximately RK 686 to RK 869.6) (BC ILMB 1995). According to the Kamloops OCP, heavy industrial lands are zoned for storage and processing of minerals and petroleum products. The proposed pipeline corridor crosses two heavy industrial zones at approximately RK 845 and RK 848 (City of Kamloops 2004).

The proposed pipeline corridor is located in the vicinity of the proposed KGHM Mining Inc. Ajax Mine near approximately RK 585 partially in the boundaries of the City of Kamloops. The proposed pipeline corridor and existing TMPL right-of-way cross the proposed mine site.

The Shovelnose property owned by Strongbow Exploration Inc. and Westhaven Ventures Inc. began exploratory work in 2012 in a 16,412 ha area approximately 30 km south of the City of Merritt (InfoMine 2012, Strongbow Exploration Inc. 2006). The proposed pipeline corridor appears to cross the property in the vicinity of RK 958.6.

Mining activities occur in the HORU RSA in the Fraser-Fort George/Thompson-Nicola Region. The mining industry in the region is booming, particularly with reference to recent mining project proposals (Williams pers. comm.). Current and proposed mines in the HORU RSA include the New Afton Mine and the Ladner Gold Project. The New Afton Mine is located approximately 5.5 km from RK 851 adjacent to the City of Kamloops. The New Afton Mine is operated by New Gold and is currently in production. New Gold holds 12,450 ha of mining leases and other claims (New Gold 2012). The Ladner Gold Project owned by New Carolin Gold Corp., which encompasses the Carolin Mine, is located approximately 3.6 km from RK 1021.1 (New Carolin Gold Corp 2012).

Aggregates

The proposed pipeline corridor crosses an area that the Fraser-Fort George Regional District Robson Valley-Canoe Upstream OCP identifies as an Aggregate Resource area (approximately RK 498), which is where the Rearguard Pump Station is located. However, close to the Rearguard Pump Station, the proposed pipeline corridor crosses the Mount Robson Corridor Development Permit Area (approximately RK 494 to RK 500). The Fraser-Fort George Regional District Robson Valley-Canoe Upstream OCP

explains that the objectives of this Permit Area are to protect development from natural hazards (such as avalanches and rockfalls), protect the natural environment and ensure that development is of high visual quality (to complement the scenic area) (RDFFG 2006). This plan does not specify any restrictions or considerations pertaining to pipeline construction within areas zoned as aggregate resource areas.

According to the Robson Valley LRMP, mining (especially quarry and aggregate resources) is encouraged within the Settlement/Agriculture Resource Management Zone (RMZ) in order to increase local employment (BC ILMB 1999). According to the Blue River OCP, the proposed pipeline corridor crosses an area zoned for mining of gravel deposits at approximately RK 613 (TNRD 2011). These plans do not specify any restrictions or considerations pertaining to pipeline construction within areas zoned as settlement/agricultural RMZ or for mining of gravel deposits.

There is a source for sand in the District of Barriere and two operators in the District of Barriere (Humphreys pers. comm.).

The proposed pipeline corridor crosses nine excavation pits from which gravel, sand or clay are removed in the Fraser-Fort George/Thompson-Nicola Region (IHS Inc. 2011b).

Oil and Gas

In BC, oil and gas tenures are concentrated in the north eastern area of the province. No oil and gas tenure areas are crossed by the proposed pipeline corridor in the Fraser-Fort George/Thompson-Nicola Region.

The proposed pipeline corridor crosses existing oil and gas pipelines in the Fraser-Fort George/Thompson-Nicola Region. The proposed pipeline corridor crosses the existing TMPL right-of-way on over 300 occasions. The proposed pipeline corridor also crosses existing gas pipelines operated by Duke Energy Field Services Canada Ltd. (on 22 occasions between approximately RK 950 and RK 988) and FortisBC Energy Inc. (on 4 occasions near approximately RK 850 and RK 954) (IHS Inc. 2013b).

7.6.3.5 Minerals, Aggregates and Oil and Gas Resources – Fraser Valley Region

Minerals

There are 72 active mineral claims, 1 mineral lease and 4 placer claims found in the proposed pipeline corridor and the HORU LSA of the Fraser Valley Region. The highest concentrations of active mineral tenures are found at approximately RK 1024.6, RK 1072.6 and RK 1114.6. Table B-20 in Appendix B summarises mineral and aggregate tenures crossed by the proposed pipeline corridor and in the HORU LSA of the Fraser Valley Region. The proposed pipeline corridor and the HORU LSA in the Fraser Valley Region do not cross any proposed or existing mines. It was noted that mining in the area has grown substantially in the past 10 years (Johnsrude pers. comm.). In the vicinity of Hope, there are mineral investigations for magnesium deposits, copper potential as well as molybdenum tenures (Advantage Hope 2011).

Aggregates

In the Fraser Valley Region, extraction of aggregates is a key economic activity (FVRD 2009). The proposed pipeline corridor is located directly adjacent to and between two quarries on Sumas Mountain, namely Sumas Shale and Jamieson Quarry from approximately RK 1115.9 to RK 117.3. Sumas Shale is operated by Clayburn Industrial Group Ltd. (Clayburn Industrial Groups Ltd. n.d.). Jamieson Quarry is a rock quarry specializing in quarried road bases, clear crushed rock and rip rap, operated by Mainland Sand and Gravel Ltd. (Mainland Sand and Gravel Ltd. 2012). Materials from aggregate are often used in road construction, construction fill and railway ballast (BC MFLNRO 2013c). Other quarries operate on Sumas Mountain, located in the HORU RSA of the Fraser Valley Region.

The proposed pipeline corridor crosses 6 excavation pits from which gravel, sand or clay are removed in the Fraser Valley Region (IHS Inc. 2011b).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement the following issues and concerns were identified with respect to aggregates in the Fraser Valley Region

- Concern was raised at the Abbotsford Community Workshop that blasting used in aggregate mining near Sumas Mountain would pose a threat to the integrity of the pipeline.

Oil and Gas

In BC, oil and gas tenures are concentrated in the northeastern area of the province. No oil and gas tenure areas are crossed by the proposed pipeline corridor.

The proposed pipeline corridor crosses existing oil and gas pipelines in the Fraser Valley Region. The proposed pipeline corridor crosses the existing TMPL right-of-way on over 100 occasions. The proposed pipeline corridor also crosses existing gas pipelines operated by Duke Energy Field Services Canada Ltd. (on 35 occasions between approximately RK 1000 and RK 1045 and at RK 1110.4) (IHS Inc. 2013b).

7.6.3.6 Minerals, Aggregates and Oil and Gas Resources – Metro Vancouver Region

Minerals

No mineral tenures, placer claims or coal licences are crossed by the proposed pipeline corridor or are in the HORU LSA of the Metro Vancouver Region.

Aggregates

Aggregate activities occur in the HORU RSA of the Metro Vancouver Region. Lafarge operates numerous aggregate production sites including Pitt River Quarries, Langley Plant, Port Kells Depot and Ward Road Aggregates (Lafarge 2012). In Coquitlam, the proposed pipeline corridor crosses the Lafarge Columbia Bitulithic Depot from approximately RK 1169.2 to RK 1169.6. In Surrey, the proposed pipeline corridor crosses an inactive sand and gravel pit at approximately RK 1156.6 (City of Surrey 2013).

The proposed pipeline corridor does not cross any excavation pits from which gravel, sand or clay are removed in the Metro Vancouver Region (IHS Inc. 2011b).

Oil and Gas

In BC, oil and gas tenures are concentrated in the northeastern area of the province. No oil and gas tenure areas are crossed by the proposed pipeline corridor.

The proposed pipeline corridor crosses existing oil and gas pipelines in the Metro Vancouver Region. In terms of oil pipelines, the proposed pipeline corridor crosses the existing TMPL right-of-way on 15 occasions and oil pipelines operated by Shell Canada Limited near the Burnaby Terminal and Westridge Marine Terminal. The proposed pipeline corridor also crosses existing gas pipelines operated by FortisBC Energy Inc. (on two occasions near approximately RK 1167.9 and RK 1181.1) (IHS Inc. 2013b).

In the City of Burnaby, the proposed pipeline corridor crosses areas zoned as petro chemical (approximately RK 1178.6, RK 1179.6 and RK 1182). Petrochemical-based industries have historically been located in City of Burnaby, including a Chevron refinery, a Shell Oil facility and Petro-Canada and Trans Mountain tank farms, each with a shipment facility on Burrard Inlet.

The PMV Consolidated Land Use Plan notes that for Bulk Cargo (such as petro chemicals), PMV will continue to support the handling of liquid bulk cargoes while also identifying opportunities to build capacity (PMV 2010).

The Burnaby OCP outlines the following goals for the petro-chemical industrial sector:

- improve the quality of air emissions and water run-off;

- ensure that contemporary safety and emergency response standards are met;
- ensure that improvements are made to increase "neighbourliness" with surrounding uses, particularly residential;
- be partners with the City and the community in undertaking environmental stewardship initiatives involving key environmental features (*e.g.,* creeks, ravines and foreshore areas) within their lands;
- strive for public access provisions, either for trail continuity or focal point purposes, involving these lands without compromising safety or operational considerations; and
- reduce operational noise and spills (City of Burnaby 1998, Section 6.0 Page 8).

7.6.4 Industrial and Commercial Use

This subsection discusses industrial and commercial use crossed by the proposed pipeline corridor and HORU LSA.

7.6.4.1 Industrial and Commercial Use – Edmonton Region

The proposed pipeline corridor and the HORU LSA of the Edmonton Region encounter areas of industrial and commercial use, particularly through Strathcona County, the City of Spruce Grove and the Town of Stony Plain.

East of the Town of Stony Plain and the City of Spruce Grove, in the HORU RSA (approximately 2 km north of RK 46.0, it is more industrial (Acheson Industrial Area) (Hanlan pers. comm.).

The proposed pipeline corridor in Strathcona County crosses through two industrial zones: Heavy Industrial (from approximately RK 0 to RK 1.5) and Light/Medium Industrial (from approximately RK 1.5 to RK 2.3). Some of the policies that the Strathcona County MDP upholds are: supporting further industrial development within Strathcona County; encourage expanded industrial tax base; provide buffers between industrial areas and other land use areas; continue setbacks for new heavy industries which could have detrimental impacts such a visual, noise, odour, emissions, fire, explosive and dangerous goods; promote development of industry close to major transportation routes; ensure that issues related to recreational and trail development within (or close to) industrial areas be addressed; require that heavy industry meets minimum industrial risk standards (bylaw 42-2012) and require new pipelines be constructed to meet Major Industrial Accidents Council of Canada (MIACC) (Strathcona County 2007).

According to the Edmonton MDP, the proposed pipeline corridor does not cross through any land zoned for industrial use within the municipal boundaries of the City of Edmonton. It does, however, cross through an industrial area (approximately RK 49) outside of the city, within Parkland County. The proposed pipeline corridor also crosses through an area zoned as a future commercial node at approximately RK 44. The Edmonton MDP explains that future commercial nodes need to be designed as transit-oriented commercial development in order to boost accessibility (City of Edmonton 2010).

The proposed pipeline corridor crosses several areas zoned as industrial/business parks (at approximately RK 57, RK 58, RK 59 and RK 60) within the City of Spruce Grove. The Spruce Grove MDP aims to provide much of the land south of Highway 16A for industrial uses, in hopes that local employment opportunities will increase and the tax base will diversify. The proposed pipeline corridor also crosses through two areas zoned as vehicle oriented commercial at approximately RK 61 and RK 62. The Spruce Grove MDP briefly describes a policy to support the development and intensification of vehicle oriented commercial zones, and to pursue ways of conserving resources and minimizing waste in the development of these zones (City of Spruce Grove 2010).

Within Parkland County the proposed pipeline corridor crosses through two areas zoned as industrial/commercial at approximately RK 49 and RK 134. The Parkland County MDP notes that it would

like to direct further industrial and commercial development within existing industrial and business parks, but encourages expansion and intensification (Parkland County 2007). The Parkland County Recreation Plan states that buffers within industrial/commercial zones can be used for recreational uses (such as parks, natural areas and greenways) (RC Strategies 2009).

Within the Town of Stony Plain the proposed pipeline corridor crosses through an area zoned for industrial use at approximately RK 63. The Stony Plain MDP states that new development within the area should review the Land Use Bylaw to avoid conflicts between industrial and non-industrial uses. The proposed pipeline corridor also crosses through an area zoned for commercial use at approximately RK 63. The commercial development objective of the Stony Plain MDP is to promote and expand the development of arterial commercial and commercial recreation along Highway 16A (Armin A. Preiksaitis & Associates 2005).

According to the Wabamun MDP, the proposed pipeline corridor crosses through an area zoned as vehicle-oriented commercial at approximately RK 100. The Wabamun MDP recognizes the opportunity to develop a commercial area adjacent to Highway 16. However, it also indicates that an Area Structure Plan will be developed for this area (in consultation with the Alberta Transportation and Parkland County) before any development occurs. Whitewood Coal Mine and the TransAlta Utilities Corporation Wabamun Generating Plant have been the two largest components of Wabamun's economy. However, the TransAlta Plant (which was the prominent local employer) shut down in 2010. The Wabamun MDP aims to convert the former TransAlta site into an industrial park, and find suitable industries for this park. The proposed pipeline corridor crosses this area (zoned as industrial) at approximately RK 100 (Village of Wabamun 2010).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues and concerns were identified with respect to industrial and commercial use in the Edmonton Region.

- The City of Spruce Grove has industrial plans for the southern portion of the city (Irving pers. comm.).
- Most of the proposed pipeline corridor in the City of Spruce Grove is located in a light industrial area. Current land uses include light industrial (north and south of KP 40.0 to KP 43.8) as well as a grandfathered private site now containing RV storage (approximately KP 42) (Irving, Mustard and Butterfield pers. comm.). A possible future industrial area is located south of KP 50.0 to KP 56.0 in the Town of Stony Plain (Frostad pers. comm.).
- Recent energy growth in the Edmonton Region has been driven by oil sands projects and a booming oil and gas industry in Alberta (Alberta Electric System Operator [AESO] 2012). Forestry, pulp and paper and chemical industries have been negatively impacted by increasing labour and associated costs and lowered demand. As a result, a number of industrial sites have either reduced production or have shut down (AESO 2009).

7.6.4.2 Industrial and Commercial Use – Rural Alberta Region

The proposed pipeline corridor and the HORU LSA of the Rural Alberta Region encounter areas of industrial and commercial use, particularly around the Town of Edson.

Industry (especially resource-based) is an essential component to the economy of Yellowhead County. Although most mining activity currently occurs in the Green Area of the County (under provincial jurisdiction), the county plans to develop land use policies to expand industry within the White Area. The Yellowhead County MDP states that the county will accommodate industrial activities that require large tracts of land, while minimizing the negative impacts of resource-based industry (Yellowhead County 2006).

The proposed pipeline corridor crosses through an area zoned as commercial/light industrial mix (approximately RK 235) and another zoned as industrial (approximately RK 228) within the Town of Edson. The Edson MDP aims to ensure that land within the town is available for future industrial

development. The Edson MDP also recognizes that oil and gas production is one of the largest industries in the area. As such, it requires special industrial services and relies heavily on the transportation systems in the area (Town of Edson 2006).

Within the Town of Edson, the northern portion of the proposed pipeline corridor is mainly residential and the south is mainly commercial/light industrial.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to industrial and commercial use in the Rural Alberta Region.

7.6.4.3 Industrial and Commercial Use – Jasper National Park Region

The existing TMPL right-of-way in the Jasper National Park Region encounters an area of industrial and commercial use around the Municipality of Jasper. The HORU LSA crosses industrial land south of Municipality of Jasper (approximately KP 376.5 to KP 377.5).

The Jasper Pump Station is located in an area of industrial use. With the exception of the pump station, the existing TMPL right-of-way does not cross any areas of industrial or commercial use (Parks Canada 2010).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to industrial and commercial use in the Jasper National Park Region.

7.6.4.4 Industrial and Commercial Use – Fraser-Fort George/Thompson-Nicola Region

The proposed pipeline corridor and the HORU LSA of the Fraser-Fort George/Thompson-Nicola Region encounters areas of industrial and commercial use, particularly near the Community of Blue River, the City of Kamloops and the City of Merritt.

According to the Fraser-Fort George Regional District Robson Valley-Canoe Upstream OCP, the proposed pipeline corridor crosses through an area zoned as resort commercial (approximately RK 522), which the OCP defines as an area suitable for large-scale resort use (RDFFG 2006).

Industrial and commercial development (except for extractive industry) is discouraged in the TNRD fringe area (TNRD 2012).

According to the Blue River OCP, much of the commercial development in the Community of Blue River is along Highway 5. The proposed pipeline corridor crosses this commercial area (and areas designated for future commercial development) at approximately RK 615. Trans Mountain has many facilities in the community and is one of the dominant users of the industrial area. Industrial areas are located primarily north of Blue River and have largely been based on transportation ventures, but the Blue River OCP states that future industrial growth will likely be tied to the forestry industry. The proposed pipeline corridor crosses this area at approximately RK 613 (TNRD 2011).

According to the Kamloops Airport Area Land Use and Development Plan, the proposed pipeline corridor crosses existing industrial and commercial zones. The industrial zone permits lighter industry to heavy industry, and business parks. The Kamloops Airport Area Land Use and Development Plan recognizes development restrictions to industrial and commercial activities due to the existing TMPL right-of-way (Urban Systems 2000).

The proposed pipeline corridor crosses an airport commercial land-use area at approximately RK 926.6 (City of Merritt 2010). Section 8.1.4.2 discusses airports in the Fraser-Fort George/Thompson-Nicola Region.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to industrial and commercial use in the Fraser-Fort George/Thompson-Nicola Region.

7.6.4.5 Industrial and Commercial Use – Fraser Valley Region

The proposed pipeline corridor and the HORU LSA of the Fraser Valley Region encounter areas of industrial and commercial use, particularly near the District of Hope.

The proposed pipeline corridor crosses some areas designated by the Hope OCP as highway commercial (at approximately RK 1043.6, RK 1046.6, RK 1048.6 and RK 1050.6). The Hope OCP defines this area as land used to service highway traffic (District of Hope 2004). In Hope, the proposed pipeline corridor also crosses areas zoned as general and heavy industrial at approximately RK 1043.6. The Hope OCP describes heavy industrial as outdoor land uses which create high impacts such as noise, smoke, fumes, vibration and electrical interference (District of Hope 2004).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to industrial and commercial use in the Fraser Valley Region.

- There is a light industrial development near Flood Hope just off Highway 1 (Fortoloczky pers. comm.).
- In Hope, there are approximately 93 ha of land zoned for light industrial and commercial use (Advantage Hope 2011).
- The proposed pipeline corridor crosses the Flying J truck stop near RK 1050.6 (Misumi pers. comm.).

7.6.4.6 Industrial and Commercial Use – Metro Vancouver Region

The proposed pipeline corridor and the HORU LSA of the Metro Vancouver Region encounter areas of industrial and commercial use, particularly near the Township of Langley, the City of Surrey, the City of Coquitlam and the City of Burnaby.

The proposed pipeline corridor crosses through an area that the Langley OCP has designated as an Industrial Growth Zone (at approximately RK 1155.6). The Langley OCP promotes industrial development within the municipality and states that all industrial development must occur within the delegated Industrial Growth Zones (Township of Langley 1979).

In Surrey, the proposed pipeline corridor does not cross major commercial areas (Luymes pers. comm.). However, the proposed pipeline corridor does cross a large area that is zoned for industrial use (approximately RK 1156.6 to RK 1160.6 and RK 1163.6 to RK 1168.6) (City of Surrey 2012).

According to the Lougheed Neighbourhood Plan in Coquitlam, the proposed pipeline corridor crosses areas zoned as urban quarter and transit village commercial (both zones are a mix of commercial, office & residential) and Service Commercial within this neighbourhood (approximately RK 1174.6). The proposed pipeline corridor also crosses an area that was historically the home to the Fraser Mills sawmill. However, currently there are new plans to convert the area into a residential and commercial area called Waterfront Village Centre. The proposed pipeline corridor crosses this centre (approximately RK 1171.6) and specifically crosses areas zoned for industrial & commercial uses within this centre. According to the Southwest Coquitlam Neighbourhood Plan, the proposed pipeline corridor crosses areas zoned as industrial and highway retail industrial (approximately RK 1169.6 to RK 1171.6) and general commercial (approximately RK 1170.6) (City of Coquitlam 2001).

In the City of Burnaby, the proposed pipeline corridor crosses areas zoned as business centres (approximately RK 1177.6 and RK 1178.6) and petro chemical (approximately RK 1178.6, RK 1179.6 and RK 1182). Some of these petro chemical areas are Trans Mountain facilities (RK 1179.6 and RK 1182). The OCP describes business centres as areas with a variety of businesses orientations including as

research, sales and service, light manufacturing and management and administration (City of Burnaby 1998). Section 7.6.3.6 discusses oil and gas resources and activities in the Metro Vancouver Region.

According to the PMV Consolidated Land Use Plan, the proposed pipeline corridor crosses an area zoned as industrial transition area (approximately RK 1181.7 to RK 1182.4) and an area zoned petro chemical (approximately RK 3.7) (Westridge Marine Terminal). The proposed pipeline corridor also crosses areas zoned as industrial from approximately RK 1156.1 to RK 1160.6 and RK 1162.6 to RK 1168.6 (PMV 2010).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues and concerns were identified with respect to industrial and commercial use in the Metro Vancouver Region.

- The Northwest Langley and Port Kells areas are mainly industrial land, valued anywhere between $1 million and $4 million per acre. It was noted that this would be an expensive area to have to buy out land (Seifi pers. comm.).
- It was noted that in the industrial area of Surrey, there are no setbacks required from the right-of-way (meaning buildings, for example, are built to the edge of – and sometimes over – the existing TMPL right-of-way). There may be some contaminated sites in industrial areas along the existing TMPL right-of-way which may be an issue during pipeline construction (Pitcairn pers. comm.).
- At the Surrey Community Workshop, it was noted that access during construction in the Port Kells area could be an issue.

7.7 Water Supply and Use

Water supply and use is discussed in the context of numerous environmental and socio-economic elements of the ESA, as follows.

- Navigable waters is discussed in Section 9.0 Navigation and Navigation Safety.
- Municipal water supply is discussed in Section 8.3 Infrastructure and Services.
- Non-traditional fishing areas are discussed in Section 7.6.1 HORU.
- Fish-bearing watercourses are discussed in the Fisheries Technical Reports (Alberta and British Columbia) (Volume 5C) and the Biophysical ESA (Volume 5A).
- Aquifers and water wells are discussed in the Groundwater Technical Report in Volume 5C.
- Points of diversion are discussed in the Groundwater Technical Report in Volume 5C.
- Watersheds are discussed in the Fisheries Technical Reports (Volume 5C) and the Biophysical ESA (Volume 5A).
- Irrigation and agricultural water use is discussed in the Agricultural Assessment Technical Report (Volume 5B).

Refer to the above sections of the Application for details of water use and supply along the proposed pipeline corridor and surrounding areas.

This section will focus on objectives and guidance pertaining to water supply and use in land use and development plans reviewed by the Project, as well as issues related to water supply and use identified during socio-economic technical discussions and other Project-related engagement for each Socio-Economic Region.

7.7.1 Water Supply and Use – Edmonton Region

Many of the land use and development plans pertinent to the region outline objectives pertaining and specifications pertaining to water supply and use, as noted below.

The Strathcona County MDP requires adequate setbacks from North Saskatchewan River Valley as well as lakes and drainage courses (Strathcona County 2007).

The Edmonton MDP outlines policies relating to water supply and use, such as requiring new development to create designs which reduce stormwater run-off (City of Edmonton 2010).

The Spruce Grove MDP outlines policies to conserve water use and protect water quality, which includes restricting development in wetlands, riparian zones and flood-prone areas, and prohibiting the release of hazardous waste/contaminants into groundwater or surface water (City of Spruce Grove 2010).

The Town of Stony Plain requires a minimum setback of 10 m from watercourse and wetlands (Armin A. Preiksaitis & Associates 2005).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to water supply and use in the Edmonton Region.

- In 2005, a CN freight train derailed in the Village of Wabamun spilling over 1.3 million litres of heavy bunker C fuel oil into Wabamun Lake; as a result, the Village of Wabamun is increasingly sensitive about water issues (Hannah pers. comm.).
- The Town of Stony Plain is located on an aquifer which requires frequent dewatering; basements are prone to flooding (Frostad pers. comm.).

7.7.2 Water Supply and Use – Rural Alberta Region

The Edson MDP identifies that the main water supply from aquifers has been in slow decline; therefore, the town is looking for ways to increase their supply. They are currently looking into two options: 1) artificially recharging the aquifers and/or 2) building a water treatment plant that will take water from the McLeod River (Town of Edson 2006).

The Yellowhead County MDP identifies that poor quantity and/or quality of drinking water has been identified in some areas of Yellowhead County. The county is using the provincial Water for Life Strategy, as a guideline for the development of water-related policies (Yellowhead County 2006).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues and concerns were identified with respect to water supply and use in the Edmonton Region.

- Concern of additional people burdening the water system of the Town of Edson was identified at the Edson Community Workshop.

7.7.3 Water Supply and Use – Jasper National Park Region

According to the Jasper National Park Management Plan, encouraging innovation in the application of new technologies related to water conservation and waste management is outlined as a strategy for managing growth and development (Parks Canada 2010).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0) no issues were identified with respect to water supply and use in the Jasper National Park Region.

7.7.4 Water Supply and Use – Fraser-Fort George/Thompson-Nicola Region

The Fraser-Fort George/Thompson-Nicola Region is located in the Fraser River, Canoe River, North Thompson River, Thompson River, South Thompson River and Thompson River watersheds.

One of the TNRD RGS goals is to protect and enhance the quality and quantity of the region's water sources (TNRD 2000). The City of Merritt is actively pursuing water conservation methods (such as the summer water conservation program) to manage demand for water (City of Merritt 2011b).

The proposed pipeline corridor crosses the following Community Watershed Zones identified in the Kamloops LRMP: White River (approximately RK 613), Avola Creek (approximately RK 656) and Gill Creek (approximately RK 731). The management objectives for these zones are to maintain the quantity and quality of the water and timing of flow (BC ILMB 1995).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to water supply and use in the region:

- Water and watershed quality were raised as important topics in the Valemount Fall Public Information Session.
- Routing concerns potentially affecting the community's water source were raised at the Blue River Fall Public Information Session.
- The District of Clearwater identified that there is a deep well for the fire department nearby in the proposed pipeline corridor, as well as a trailer park, and the existing Trans Mountain right-of-way crosses a waterline that serves the community hall, fire department and trailer park (Madden pers. comm.).
- The Peterson Creek watershed is important to residents; many ranches make use of it (Morris pers. comm.). Peterson Creek is located in the City of Kamloops.

7.7.5 Water Supply and Use – Fraser Valley Region

In order to protect the water quality in the region, the Fraser Valley Regional Growth Strategy encourages adopting Best Management Practices (FVRD 2004).

The Abbotsford–Sumas aquifer is an important source of water for the City of Abbotsford and therefore the OCP states that development must be done in a way that protects the aquifer from contamination (City of Abbotsford 2005).

The Chilliwack OCP states that the primary water source in Chilliwack is its large aquifers, which have been awarded the title of Canada's best drinking water. As a result of increased exposure to surface contamination, the City has created the *Aquifer Protection Act* and asks that future development address the risks of water contamination (City of Chilliwack 1998). The City of Chilliwack is currently in the process of developing the East Chilliwack Aquifer for its future groundwater supply and plan to commission groundwater wells in the next ten years (Sanderson pers. comm.).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to water supply and use in the Fraser Valley Region.

- The City of Chilliwack has concerns about the potential effects of an accident or malfunction on groundwater, in particular the Vedder River Fan Aquifer (also identified as the Sardis aquifer locally) (Blain pers. comm.).
- The City of Chilliwack has a draft Aquifer Protection Bylaw which identifies draw down zones (Blain pers. comm.).

- The City of Chilliwack noted that there are no companies bottling water on the existing Trans Mountain right-of-way (Blain pers. comm.).

- The District of Hope's water supply is from a groundwater aquifer (Susan Johnston pers. comm.).

- Groundwater is the prime concern of the District of Hope. There are several municipal wells in the vicinity of the pipeline. The District of Hope welcomes the proposed pipeline corridor deviation away from the municipal wells (Fortoloczky, Misumi pers. comm.).

- There are no water intakes on the Fraser River or the Coquihalla River for the District of Hope (Vaughan pers. comm.).

7.7.6 Water Supply and Use – Metro Vancouver Region

The Metro Vancouver Region is located entirely in the Fraser River watershed, with the exception of a short segment in Surrey and Burnaby located in the South Coast Rivers Watershed, which is defined by smaller watercourses draining directly into the Pacific Ocean.

Metro Vancouver developed the Drinking Water Management Plan in 2011 to ensure a sustainable and affordable supply of water to the region. Metro Vancouver works with member municipalities to ensure access to drinking water and the Health Authorities of the BC Ministry of Health provides oversight (Metro Vancouver 2011b).

According to the Township of Langley Water Management Plan, approximately 80% of the community's water supply is provided from the area's aquifers, which are accessed by municipal and private wells. However, due to overuse, the water levels in these aquifers are declining, especially in intensively used aquifers such as Hopington and Aldergrove. The Hopington aquifer (over which the proposed pipeline corridor crosses) is considered to be one of the most vulnerable aquifers (in terms of groundwater contamination) in the Fraser Valley (Compass Resource Management 2009).

- In order to protect the quantity and quality of the water supply in Langley, the Water Management Plan.

- States that new development should not negatively affect aquifers from being replenished.

- Aims to develop an integrated system for issuing drilling authorizations.

- Restricts the use of high-risk contaminants in areas above vulnerable aquifers (Compass Resource Management 2009).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to water supply and use in the Metro Vancouver Region.

7.8 Aesthetic Attributes

Aesthetic attributes include changes in viewsheds, sensory disturbance related to nuisance visual disturbance (*e.g.,* lighting, temporary construction activity/materials/clearing), air emissions, noise and odour. Construction of the Project will result in the presence and operation of equipment, vehicles, and the activity of construction workers. Air and noise emissions will include emissions and sound from construction equipment and dust from vehicles.

A Viewshed Modelling Analysis (VMA) was conducted to provide information related to the potential visual impacts of new or notably altered above-ground facilities to be constructed as part of the Project. The VMA assists in determining the visibility of selected Project facilities from a set of locations, using GIS software that determines the visibility, or the view, of one location to and from another location. For this Project, VMA was conducted for five key Project locations with proposed new or changed above-ground

facilities. These Project facilities are the Edmonton Terminal, Black Pines Pump Station, Sumas Terminal, Burnaby Terminal and Westridge Marine Terminal. Existing information regarding visual conditions in the vicinity of the five facility sites was collected and viewshed modelling was conducted from a select number of observer viewpoints (OVs) to assess potential impacts to existing visual conditions. Additional information is found in the Viewshed Modelling Analysis Technical Report of Volume 5D.

BC Forest Planning and Practices Regulation categorizes visual quality objectives (VQOs) in the following management categories from important public viewpoints: preservation; retention; partial retention; modification; and maximum modification. Preservation denotes very small-scale alteration to a forest landscape; retention denotes alteration that is small in scale and difficult to see; partial retention is small to medium scale and easy to see; modification is large in scale and easy to see; and maximum modification denotes an alteration that is very large in scale and very easy to see (Forest Planning and Practices Regulation BC Reg. 269/2010). While VQOs pertain to forestry practices, they provide an indication of visual priorities in certain areas of BC. VQOs do not exist in Alberta.

In Alberta, noise is regulated by the AER under Directive 38 *Noise Control Guidelines* (Alberta Energy Resources Conservation Board [ERCB] 2007). Directive 38 outlines requirements for the control of noise as they apply to operations and facilities under the jurisdiction of the AER. In BC, the BC Oil and Gas Commission (OGC) *Noise Control Best Practices Guideline* outlines requirements for noise and guides industry through best practices for noise control management as it applies to operations, production facilities and gas processing plants (BC OGC 2009). Trans Mountain will ensure that construction activities will be in compliance with the AER Directive 38 *Noise Control Guidelines* (ERCB 2007) and BC OGC *Noise Control Best Practice Guideline* (BC OGC 2009).

7.8.1 Aesthetic Attributes – Edmonton Region

The Edmonton Region crosses a predominantly urban and suburban landscape. The Edmonton MDP states the residential areas should be protected from impacts such as noise and dust (City of Edmonton 2010). The Edmonton Transportation Master Plan notes the Urban Traffic Noise Policy, which ensures that land is developed in way that noise impacts are mitigated (City of Edmonton 2009). Parkland County has aesthetic standards for development, especially along the Highway 16 corridor, and asks that certain designs and landscaping be applied along this area. The Parkland County MDP also suggests that buffering and landscaping techniques may be required in order to mitigate noise impacts caused by roadway, railway or airport operations (Parkland County 2007). The Stony Plain MDP recognizes that industrial uses could have nuisance effects (such as noise, smell, dust, smoke, vibration) especially near residential areas, so states that buffering and separation distance requirements are adhered to in order to minimize these effects (Armin A. Preiksaitis & Associates 2005). The Village of Wabamun is trying to redefine itself as a tourist town, therefore, aesthetics are very important (especially at entrance ways into the village). The Council asks that any future development complements or improves the aesthetic qualities of Wabamun (Village of Wabamun 2010).

The proposed pipeline corridor in the Edmonton Region encounters six areas with noise bylaws in effect. Table B-21 in Appendix B summarises noise regulations for communities within the proposed pipeline corridor of the Edmonton Region.

In the Edmonton Region, viewshed modeling was conducted of the proposed expansions of the Edmonton Terminal from two observation viewpoints (OVs). From all OVs, almost the entire viewshed is dominated by anthropogenic disturbance given the existing industrial setting. Visual attributes of the existing landscape include the existing Edmonton Terminal, as well as dirt roads, cement blockades, fencing, vehicles, lighting and transmission lines. There are some narrow green areas, including grass and some trees, visible from some locations. Given the existing industrial landscape, the site is considered to have a high visual absorption capacity (VAC). This refers to the relative capacity of a landscape to absorb human-made alterations. Refer to the Viewshed Modelling Analysis Technical Report in Volume 5D.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues and concerns were identified with respect to aesthetic attributes in the Edmonton Region.

- The cumulative effects of other Projects using the same roads and causing noise that could affect residents were a concern of Strathcona County (Mills pers. comm.).
- The issue of noise and light pollution during construction was raised at the Edmonton East and West Community Workshops.
- Noise and dust are key concerns within the Village of Wabamun (Hannah pers. comm.).

7.8.2 Aesthetic Attributes – Rural Alberta Region

The Rural Alberta Region crosses a predominantly rural and suburban landscape. The Yellowhead County MDP discourages any development that would interfere with views of natural features (Yellowhead County 2006). The Edson MDP explains the importance of the Town of Edson's visual character (especially in regards to its parks and recreational facilities), and states that future development must protect this visual character or improve it (Town of Edson 2006). Aesthetics are important for the Town of Hinton as the town is described as the Gateway to the Rockies. The town has created an initiative called Hinton Proud, which promotes cleanliness and beautification initiatives. Because of this, the Hinton MDP requires that future development be of high visual quality, that existing vegetation be used to screen development, and that municipal bylaws be enforced to minimize nuisance and unsightly premises (Town of Hinton 1998). Beautification is one of the key strategic goals in the Hinton Community Development and Enhancement Plan, stating that the town has aesthetically pleasing developed areas, which is a component of the town's success and community pride (ISL Infrastructure Systems 2003).

The proposed pipeline corridor in the Rural Alberta Region encounters three areas with noise bylaws in effect. Table B-21 in Appendix B summarises noise regulations for communities within the proposed pipeline corridor of the Rural Alberta Region.

No new or notably altered above ground facilities are proposed in this region. While some pump stations will be expanded, expansions will take place in the context of an existing industrial facility and will be designed to be consistent with the existing look at each facility. As such, viewshed modeling was not undertaken of any facilities in this region.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues and concerns were identified with respect to aesthetic attributes in the Rural Alberta Region.

- The Edson RCMP identified that there are often small noise and nuisance complaints as a result of work crews, but these complaints are usually resolved quickly (Chomeakwich pers. comm.).
- Noise and light pollution during construction was raised as an issue at the Edson Community Workshop.
- Construction noise can be an issue at night in residential areas within the Town of Hinton (Knight pers. comm.).
- A Hinton Bike Association viewpoint that is located south of the proposed pipeline corridor was identified at the Hinton Community Workshop.

7.8.3 Aesthetic Attributes – Jasper National Park Region

The Jasper National Park Region crosses a predominantly forested and rural landscape. The Jasper National Park Management Plan identifies a key action to strengthen best management practices to

reduce the aesthetic impact of Parks Canada and third-party operational activities within the park. The plan aims to ensure that visitor use does not impair aesthetic values (Parks Canada 2010).

The Project in the Jasper National Park Region encounters one area with noise bylaws in effect. Table B-21 in Appendix B summarises noise regulations for communities within the Jasper National Park Region.

No issues or concerns were identified with respect to aesthetic attributes in the Jasper National Park Region.

No new or notably altered above-ground facilities are proposed in this region. While the Jasper Pump Station will be expanded, the expansion will take place in the context of an existing industrial facility and will be designed to be consistent with the existing look at the facility. As such, viewshed modeling was not undertaken in this region.

7.8.4 Aesthetic Attributes – Fraser-Fort George/Thompson-Nicola Region

The Robson Valley LRMP identifies an overall visual quality goal of maintaining and enhancing the scenic beauty and visual quality of the planning area with particular attention to the Robson Valley Settlement Corridor. Numerous parks within the Robson Valley LRMP area identify areas of visual importance. The Rocky Mountain Trench RMZ (approximately RK 492) identifies maintaining and restoring the natural scenic beauty of the Rocky Mountain Trench as a primary resource for the benefit of residents and visitors alike as a management objective. The Settlement/Agriculture RMZ A does not specifically identify visual quality as an objective but it does identify that visual concerns are of importance within this heavily travelled corridor. A defined strategy of the Robson Valley LRMP to achieve visual quality goals is that development (such as pipelines) must have a visual management plan made available for public input (BC ILMB 1999).

The TNRD RGS encourages the adoption of policies that will reduce or prevent air pollution (TNRD 2000).

Residents of the Community of Blue River are in the process of developing VQOs due to the disruption of forested areas (TNRD 2011).

The Kamloops LRMP identifies visually sensitive areas, which are viewpoints identified through planning processes and viewsheds or viewscapes visible from public use areas, travel corridors and communities (BC ILMB 1995). VQOs comprise four management categories: preservation; retention; partial retention; and modification. The proposed pipeline corridor in the Fraser-Fort George/Thompson-Nicola Region crosses retention, partial retention and modification VQO areas. The proposed pipeline corridor also crosses scenic areas designated under the *Forest Range and Practices Act*. Clusters of retention VQOs are crossed from RK 498 to RK 505 and RK 897 to RK 899. Clusters of partial retention VQOs are crossed from RK 503 and RK 506, RK 530 to 536, RK 677 to RK 682 and RK 704 to RK 735. Clusters of modification VQOs are crossed from RK 563 to RK 653 and RK 939 to RK 950. No preservation VQOs are crossed by the proposed pipeline corridor in the Fraser-Fort George / Thompson-Nicola Region (BC MOF 2008).

The Kamloops Airshed Management Plan recognizes activities such as road dust and open burning as contributors to haze, which can decrease visibility. The Kamloops Airshed Management Plan also indicates that the City of Kamloops has a Fire Prevention Bylaw, which generally restricts open burning (City of Kamloops 2004).

The Coquihalla Highway is a tourism travel corridor, offering scenic views and connecting the Lower Mainland with the Okanagan and interior BC (BC Ministry of Transportation and Infrastructure 2012a).

Table B-22 in Appendix B summarises noise regulations for communities within the proposed pipeline corridor of the Fraser-Fort George/Thompson-Nicola Region.

In the Fraser-Fort George/Thompson-Nicola Region, viewshed modeling was conducted of the proposed new Black Pines Pump Station. This pump station is the only greenfield facility proposed as part of the Project. Viewshed modeling was done from three OVs of the proposed pump station site. The proposed Black Pines Pump Station is located approximately 30 km north of the City of Kamloops, on Westsyde Road. The area is currently forested and will be cleared and graded for the pump station. From the three OVs, the viewscape of the proposed site generally has a low level of existing anthropogenic disturbance, and consists of cleared, grassy areas, visible flora, with Westsyde Road cutting through the view in some locations, is land. Certain OVs also includes views of rural residential properties. Given the low level of existing disturbance, the site is considered to have a relatively low VAC. The area has a partial retention VQO. Refer to the Viewshed Modelling Analysis Technical Report in Volume 5D.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues and concerns were identified with respect to aesthetic attributes in the Fraser-Fort George/Thompson-Nicola Region.

- Viewsheds during construction are a concern for Tourism Kamloops (Morris pers. comm.). Viewsheds along Lac Le Jeune Rd (access to Lac Le Jeune Provincial Park) are important. Lac Le Jeune Rd is access for recreation opportunities and is promoted to tourists (Morris pers. comm.). The view of Kamloops from the Coquihalla Highway between the Lac Le Jeune/Logan Lake exit and Inks Lake exits is a key viewshed (Morris pers. comm.). Ajax mine is a huge issue regarding viewsheds. If a viewshed is marred, it can make the area look industrial. Kamloops positions itself as a healthy, recreational place, which are important community and tourism values (Morris pers. comm.).

- Concerns that construction noise would annoy tourists were identified at the Valemount Community Workshop.

- Construction noise was raised as an issue at the Blue River Community Workshop, in relation to birdwatchers and summer tourists, particularly at campgrounds.

- At the Clearwater Community Workshop, concern regarding light pollution during construction in the community was identified.

- Any impacts on air quality or freshwater related to spills will impact tourism and have public relations implications for the Kamloops area. Public perception and reputation are important to tourism (Morris pers. comm.).

- The aesthetic value of grasslands, in terms of vegetation as well as visual contours, was identified at the Kamloops Community Workshop. It was noted that altered contours along the existing TMPL right-of-way are particularly visible near the Kamloops Airport.

- Visual impact in relation to revegetation in grasslands was noted at the Kamloops Community Workshop as an issue.

7.8.5 Aesthetic Attributes – Fraser Valley Region

The Fraser Valley Region crosses a predominantly urban, suburban and agricultural landscape. The Fraser Valley Regional Growth Strategy encourages the implementation of the FVRD Air Quality Management Plan (FVRD 2004). Open burning is restricted in the City of Chilliwack to improve air quality (City of Chilliwack 1998). According to the Chilliwack Zoning Bylaw, uses that produce the following are prohibited in all zones unless specifically permitted:

- unreasonable noise, heat or glare;
- unsafe levels of dust, fumes, ash or odour; and
- ground vibration (City of Chilliwack 2001).

The Abbotsford OCP states that development adjacent to agricultural lands must consider ways to minimize noise and visual impacts. Furthermore, prominent landscape features within the Straiton Area (approximately RK 1117.6 to RK 1118.6) are to be protected in order to maintain the "visual and aesthetic characteristics of the area" (City of Abbotsford 2005 p. A16).

The proposed pipeline corridor in the Fraser Valley Region encounters three areas with noise bylaws in effect. Table B-22 in Appendix B summarises noise regulations for communities within the proposed pipeline corridor of the Fraser Valley Region.

The proposed pipeline corridor in the Fraser Valley Region crosses retention, partial retention, and modification VQOs. A cluster of retention VQOs are crossed from RK 1005 to RK 1011. Clusters of partial retention VQOs are crossed from RK 1013 and RK 1021, RK 1031 to RK 1072 and RK 1104 to RK 1115. A modification VQO is crossed from RK 1025.81 to RK 1026.7. No preservation VQOs are crossed by the proposed pipeline corridor in the Fraser Valley Region (BC MOF 2008).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues and concerns were identified with respect to aesthetic attributes in the Fraser Valley Region.

- The City of Chilliwack raised concerns regarding the incremental linear disturbance and how it may lead to a sterilization of the landscape in terms of visual aesthetics (Sanderson pers. comm.).
- The location of the Sumas Terminal, in relation to its proximity to urban development, and odour was raised as a concern at the Abbotsford Community Workshop.
- Concern regarding aesthetics at watercourse crossings during construction, in relation to loss and alteration of riparian areas, was raised at the Hope Community Workshop.

In the Fraser Valley Region, viewshed modeling was conducted of the proposed expansion of the Sumas Terminal from 1 OV. For the existing viewshed from this OV, the foreground is covered with low-lying bushes and shrubs. The middle ground consists almost entirely of anthropogenic disturbance due to the tanks, buildings, roads and cleared area of the existing Sumas Terminal. The background, behind the terminal area, is forested. Further analysis indicates that approximately 12.0% of the existing viewshed is comprised of anthropogenic disturbance, most of which is associated with the existing Sumas Terminal. Given the existing industrial disturbance, the area is considered to have a relatively high VAC. Refer to the Viewshed Modelling Analysis Technical Report in Volume 5D.

7.8.6 Aesthetic Attributes – Metro Vancouver Region

The Metro Vancouver Region crosses a predominantly urban and suburban landscape. The Surrey OCP states that in areas of high visibility (such as along the Fraser River, where the proposed pipeline corridor is adjacent), development must follow guidelines to improve the visual environment (City of Surrey 2012). The Coquitlam OCP addresses noise control issues and suggests finding ways to mitigate noise impacts of heavier industry and other activities in future land use changes (City of Coquitlam 2001). The Burnaby OCP indicates that for the Petro-Chemical Industrial Areas it aims to reduce operational noise (City of Burnaby 1998). Section 7.6.3.6 discusses oil and gas resources and activities in the Metro Vancouver Region. According to the PMV Consolidated Land Use Plan, PMV will examine mitigation measures for noise, odour, light and dust produced within industrial areas (PMV 2010).

The proposed pipeline corridor in the Metro Vancouver Region encounters four areas with noise bylaws in effect. Table B-22 in Appendix B summarises noise regulations for communities within the proposed pipeline corridor of the Metro Vancouver Region.

The proposed pipeline corridor in the Metro Vancouver Region does not cross any VQOs (BC MOF 2008).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues and concerns were identified with respect to aesthetic attributes in the Metro Vancouver Region.

- In Surrey, there are locations along the proposed pipeline corridor where trees have been installed to ameliorate views and for noise abatement, particularly from the CN rails (Baron pers. comm.). It was noted that the Project would likely be re-disturbing areas that have had trees installed for visual compensation from past projects (Luymes pers. comm.).

- Noise, air and visual pollution have been identified as issues by Westridge community members related to the expansion of the Westridge Marine Terminal, both from ships and the dock for a variety of users (recreation, SFU, residents) (Burnaby Community Workshop).

- Light pollution from the Westridge Marine Terminal was raised as a concern at the Burnaby Community Workshop.

- Concerns regarding noise near urban areas, particularly Castle Hill, during construction was identified at the Langley Community Workshop.

- Concerns regarding noise pollution during construction were identified at the Surrey Community Workshop.

- Noise issues related to helicopters patrolling the existing TMPL right-of-way were noted at the Burnaby Community Workshop.

In the Metro Vancouver Region, viewshed modeling was conducted of the proposed expansion of the Burnaby Terminal and the Westridge Marine Terminal. For the Burnaby Terminal, three OVs were chosen from various locations in the City of Burnaby. For the Westridge Marine Terminal, three OVs were chosen reflecting various views of the terminal site from both the south and northern shore of the Burrard Inlet. There are varying levels of existing anthropogenic disturbance from these viewsheds, related to the urban/suburban landscape and existing industrial setting within which both facilities are located. The Burnaby Terminal and the Westridge Marine Terminal are not situated in areas with a VQO designation. Refer to the Viewshed Modelling Analysis Technical Report in Volume 5D.

7.9 Marine Commercial, Recreational and Tourism Use

The discussion of marine commercial, recreational and tourism use is relevant only to the Metro Vancouver Region. Marine commercial, recreational and tourism in the marine HORU RSA, which includes the Burrard Inlet east of the First Narrows, is diverse, both from a biophysical and socio-economic point of view. Many areas are subject to intense and competing uses.

The shoreline of Burrard Inlet is heavily industrialized in several areas. The marine area is intensely used by commercial users such as cargo ships (*e.g.,* forest products, steel products, machinery, grains, coal, chemicals, potash and sulphur), oil tankers, cruise ships and container ships, accessing 23 major terminals through the Inlet (PMV 2013). Use of the central Narrows section of Burrard Inlet is closely regulated by local authorities. Two cruise ship terminals are present in Burrard Inlet with multiple cruise ship companies accessing the terminals year-round (PMV 2013). Recreational use is high in marine areas near the heavily populated Lower Mainland, and recreational users access major destinations through Burrard Inlet. For example, Indian Arm is accessed through Burrard Inlet and is lined along much of the shoreline with provincial and regional parks. The area is a popular destination for boaters, kayakers, scuba divers, and recreational fishers. Moreover, although the proposed pipeline corridor does not cross Barnet Marine Park, it does cross Burnaby's Urban Trail Network (approximately RK 1182), which provides pedestrian access to the marine park (City of Burnaby 1998).

Marine recreational uses in the HORU RSA of the Metro Vancouver Region include boating, swimming, paddling, tours, canoeing and kayaking. Cates Park in North Vancouver and Barnet Marine Park in the City of Burnaby both offer boating and swimming recreational opportunities. Communities such as North

Vancouver and Port Moody have marinas, tour operators and boat, kayak, paddleboard and canoe rentals.

Commercial fishers in Burrard Inlet mainly harvest Dungeness crab, prawn and shrimp. Tourism use of Burrard Inlet includes cruise ships berthing in the Inner Harbour cruise terminals, whale-watching operators transiting through the inlet to access whale habitat areas in the Strait of Georgia and Haro Strait, and commercial sportfishers transiting through the inlet to access sport fishing areas in the Strait of Georgia and other regions for salmon and other popular sportfish species. Tourism users also access Indian Arm for scenic cruises, fishing and dive charters.

The TERMPOL Origin, Destination and Marine Traffic Volume Survey (TERMPOL Study 3.2 in Volume 8C) and Volume 8A, Section 4.4.1.4 describe current and projected marine traffic volumes in the Marine RSA, including portions of the Burrard Inlet. In eastern Burrard Inlet near the Westridge Marine Terminal, marine vessel movements in 2012 totaled approximately 6,900 of which approximately 5,600 were tug movements (*i.e.,* harbour assist tugs and all other tug movements) and 108 were cargo ships. These counts do not include small vessels that do not report to Vessel Traffic Services of the Canadian Coast Guard (CCG) (*e.g.,* sailing yachts, motor yachts and sport fishing boats less than 30 m in length, or other vessels less than 20 m in length). The TERMPOL studies estimate that vessel traffic will increase by 1.0% per year for cargo/carrier, tugs, service, passenger and other vessel types though 2018. Tanker vessels are anticipated to grow 4.0% annually through to 2018 (not including Project-related marine vessels).

Further detail on marine commercial, recreational and tourism use in the marine waters of the Burrard Inlet is found in the Marine Commercial, Recreational and Tourism Use Technical Report – Marine Transportation in Volume 8B. Further information on traditional Aboriginal marine use is found in the Traditional Marine Resource Use Report in Volume 8B.

8.0 EXISTING CONDITIONS – INFRASTRUCTURE AND SERVICES

This Section discusses the existing conditions related to physical infrastructure and community infrastructure and services in the study area. Factors that are discussed include:

- transportation infrastructure (*e.g.,* roads, rail and air);
- linear infrastructure (*e.g.,* transmission lines, pipelines) and power supply;
- waste and water infrastructure;
- housing;
- educational services;
- emergency, protective services and social services; and
- recreational amenities.

Discussion is focused on infrastructure that may be physically disturbed by the Project, as well as the overall capacity of community infrastructure and services to meet Project-related changes in demand.

Health infrastructure and services are discussed in the Community Health Technical Report of ESA Volume 5D.

See Section 9.0 of this report (Navigation and Navigation Safety) for a discussion of the use of navigable watercourses.

8.1 Transportation Infrastructure

This subsection discusses existing transportation infrastructure *(i.e.,* roads and traffic, airports, railways, and ports) located in the vicinity of the Project.

Provincial highways in Alberta are maintained by Alberta Transportation and are designated as primary highways. Primary highways in Alberta are divided into two series. The 1 to 216 series have the highest traffic volumes, are mostly paved and make up the core highway network. This report will discuss only provincial highways in the 1 to 216 series in the vicinity of the Project. The 500 to 986 series (formerly secondary highways), have lower traffic volumes, are largely gravel and make up the local highways (Alberta Transportation 2013). Table 8.1-1 describes the highway infrastructure in the Project vicinity in Alberta.

Provincial highways in BC are classified into five categories: primary highway; secondary highways; major roads; minor roads; and local roads. Primary highways are often freeways, expressways or arterials and connect major population centres and activity nodes. Secondary highways are generally arterials that integrate the primary highways and connect smaller urban areas (BC MOTI 2009). The BC MOTI noted that the Project does not present any substantial challenges. It was noted that once detailed information and needs of the Project are available, BC MOTI will be able to provide feedback on specific issues as they arise (Atkins pers. comm.). There are numerous large projects that make use of BC's highways, therefore large/oversize vehicles are common; all loads would have to meet legal weight restrictions (Atkins pers. comm.). It was noted that highways cannot be closed and that boring under a highway does not pose a concern to BC MOTI's jurisdiction. Regarding pull outs for staging areas, BC MOTI noted that Trans Mountain will have to meet engineering standards and that a detailed Traffic Management Plan is required (Atkins pers. comm.). Table 8.1-2 describes the highway infrastructure in the Project vicinity in BC.

TABLE 8.1-1

HIGHWAY INFRASTRUCTURE IN THE PROJECT VICINITY IN ALBERTA

Highway Number	Highway Name	Potential Project Use (yes/no)	Crossed by the Corridor (yes/no)	Highway Description
Highway 216	Anthony Henday Drive	Yes	RK 2.3, RK 12.1, RK 21.4, RK 27.7, RK 34.6	• Extends south from Highway 16 in the City of Edmonton • Secondary highway • Two lanes (one lane in each direction)
Highway 100	Sherwood Park Freeway/Wye Road	Yes	RK 5.4	• Secondary highway • Two lanes (one lane in each direction)
Highway 14	Whitemud Drive	Yes	RK 11.9	• Branches west from Highway 216 in the City of Edmonton • Primary highway • Two lanes (one lane in each direction)
Highway 2	Gateway Boulevard North-West/Calgary Trail North-West	Yes	RK 22.9	• Primary highway • Two lanes (one lane in each direction)
Highway 628	Whitemud Drive North-West	Yes	RK 43.5	• Secondary highway • Two lanes (one lane in each direction)
Highway 60		Yes	RK 48.8	• Branches south from Highway16 at Acheson, east of Spruce Grove • Primary highway • Two lanes (one lane in each direction)
Highway 16A	Yellowhead Highway	Yes	RK 62.1, RK 74.5	• Branches southeast of Highway16 in Parkland County • Primary highway • Two lanes (one lane in each direction)
Highway 779	48th Street	Yes	RK 65.9	• Secondary highway • Two lanes (one lane in each direction)
Highway 16	Yellowhead Highway	Yes	RK 93.6, RK 99.3 (bridge), RK 187.1, RK 248.2, RK 259.9, RK 278.2, RK 292.6, RK 312.4, RK 329.0	• Primary highway • Two lanes (one lane in each direction)
Highway 22		May be utilized	Not crossed by the proposed pipeline corridor	• Branches south from Highway 16 in Parkland County, east of the Community of Evansburg • Two lanes (one lane in each direction)
Highway 32		May be utilized	RK 200.1	• Branches north from Highway 16 in Yellowhead County, east of the Town of Edson • Primary highway • Two lanes (one lane in each direction)
Highway 47		May be utilized	Not crossed by the proposed pipeline corridor	• Branches south from Highway 16 in Yellowhead County, west of the Town of Edson
Highway 748		May be utilized	RK 228.8	• Secondary highway • Four lanes (two lanes in each direction)
Highway 40		May be utilized	RK 326.3	• Branches south from Highway 16 in the Town of Hinton • Primary Highway • Two lanes (one lane in each direction)
Highway 93	Icefield Parkway	May be utilized	Not crossed by the proposed pipeline corridor	• Branches south from Highway 16 in the Municipality of Jasper • Two lanes (one lane in each direction)

Sources: Alberta Transportation 2013

TABLE 8.1-2

HIGHWAY INFRASTRUCTURE IN THE PROJECT VICINITY IN BRITISH COLUMBIA

Highway Number	Highway Name	Potential Project Use (yes/no)	Corridor Crossing Location	Highway Description
Highway 16	Yellowhead Highway	Yes	Not crossed by the proposed pipeline corridor	• Primary highway • Core route of the National Highway System • Two lanes (one lane in each direction)
Highway 5	Yellowhead Highway	Yes	RK 521.9, RK 529.7, RK 545.6, RK 552.3, RK 582.7, RK 608.1, RK 625.6, RK 626.9, RK 651.0, RK 660.9, RK 686.6, RK 688.2, RK 689.0, RK 692.5, RK 695.0, RK 704.1, RK 708.1, RK 710.0, RK 714.1, RK 717.1, RK 718.9, RK 726.4, RK 727.6, RK 737.0, RK 758.0, RK 760.1, RK 760.9, RK 762.0, RK 762.8, RK 763.2, RK 767.7	• Primary highway • Core route of the National Highway System • Two lanes (one lane in each direction)
Highway 5	Coquihalla Highway	Yes	RK 938.7, RK 940.1, RK 966.5, RK 980.5, RK 1000.7, RK 1010.8, RK 1018.5, RK 1026.9, RK 1028.3, RK 1032.9, RK 1044.2, RK 1044.4	• Primary highway • Core route of the National Highway System • Two lanes (one lane in each direction) • Near Hope, Highway 5 is also Highway 3, Crowsnest Highway
Highway 5A	Princeton-Kamloops Highway	Unlikely	RK 926.5, RK 929.7	• Primary highway • Core route of the National Highway System • Two lanes (one lane in each direction)
Highway 1/97	Trans-Canada Highway/Okanagan Vernon-Monte Creek	Yes	RK 850.5	• Primary highway • Core route of the National Highway System • Canada's longest national road • Connects provincial highways to the Pacific coast • Four lanes (two lanes in each direction)
Highway 1	Trans-Canada Highway	Yes	RK 1054.1 (arterial), RK 1045.3 (ramp), RK 1046.5, RK 1046.6, RK 1051.2, RK 1051.3, RK 1054.5, RK 1054.6, RK 1062.5, RK 1062.6, RK 1064.5, RK 1078.8, RK 1078.9, RK 1088.4, RK 1088.5, RK 1114.1, RK 1166.9, RK 1173.1	• Primary highway • Core route of the National Highway System • Canada's longest national road • Connects provincial highways to the Pacific coast • Four lanes (two lanes in each direction)
Highway 9	Agassiz-Rosedale Highway	No	RK 1081 (ramp)	• Secondary highway • Connects Highway 1 and Highway 7 • Provides access to Agassiz/Harrison Hot Springs • Two lanes (one lane in each direction)
Highway 11	Abbotsford-Mission Highway	May be utilized	RK 1123.8	• Primary highway • Core route of the National Highway System • International goods movement route • Connects to the USA border at Huntingdon • Two lanes (one lane in each direction)
Highway 13	264th Street	May be utilized	RK 1139.9	• Secondary highway • International goods movement route • Connects to the USA border
Highway 7	Lougheed Highway	Yes	RK 1176.8, RK 1177.9	• Municipal highway
Highway 15	Pacific Highway	May be utilized	Not crossed by the proposed pipeline corridor	• Primary highway • Major international goods movement route • Connects to the USA border

Sources: BC MOTI 2009, Transport Canada 2012

The Trans-Canada Highway is Canada's longest national road. It extends across each province in Canada, and connects provincial highways to the Pacific coast in BC. Construction of the Trans-Canada Highway began in 1950, and was completed in 1971. The Trans-Canada Highway consists of various

routes (links). In BC, the proposed pipeline corridor crosses Highway 1. In Alberta and BC, the proposed pipeline corridor crosses Highway 16, which is a link of the Trans-Canada Highway. Although Highway 16 was not constructed under the *Trans-Canada Highway Act*, portions of the highway have been designated as part of the Trans-Canada Highway system. Highways are provincial jurisdiction, except where the Trans-Canada Highway crosses national parks. In those instances, maintenance is the responsibility of the Government of Canada (Transport Canada 2012). The Trans-Canada Highway (Highway 1) is crossed by the proposed pipeline corridor in the Fraser-Fort George/Thompson-Nicola Region, the Fraser Valley Region and the Metro Vancouver Region.

8.1.1 Transportation Infrastructure – Edmonton Region

The following subheadings describe existing transportation infrastructure related to roads and traffic, airports, railways, and ports in the Socio-Economic RSA of the Edmonton Region.

8.1.1.1 Roads

In the Edmonton Region, most of the proposed pipeline corridor loosely parallels Highway 216 (Anthony Henday Drive) and Highway 16 (Yellowhead Highway). Anthony Henday Drive is a four lane (two lanes in each direction) hard surface secondary expressway and is located within the TUC, commonly referred to as the Edmonton Ring Road. The responsibility of the Province of Alberta, the TUC was planned in the late 1970s with land being purchased during the 1980s and 1990s. Anthony Henday Drive circles the City of Edmonton, is part of the North/South Trade Corridor and was planned to alleviate heavy goods and service traffic from the city's highway network (Alberta Transportation 2013).

Communities in the Edmonton Region are serviced by Highway 16, which is part of Canada's National Highway System and forms the Yellowhead branch of the Trans-Canada Highway. Highway 16 is crossed by the proposed pipeline corridor at several locations. Highway 16 is a two lane, extending to four lanes in some areas, hard surface primary expressway. Highway 16 is anticipated to be the main highway utilized for the movement of equipment and materials to various pipeline spread locations in the Edmonton Region. Highways are supported by a comprehensive county grid system so in the event of delays on these highways, alternate routes are available (Hanlan pers. comm.).

Other highways in the Socio-Economic RSA that may be utilized by the Project for the purposes of moving equipment and materials to pipeline spread construction staging areas include Highways 14, 2 and 60.

There are approximately 5 permanent traffic measurement sites located on Highway 16 within the Edmonton Region. Traffic count data is available for 2009, 2010 and 2011 for the sites along Highway 16. Table C-1 in Appendix C presents the Monthly Average Daily Traffic (MADT), Annual Average Daily Traffic [AADT] and Average Annual Daily Traffic by Month [AADTM]) volumes for these sites and Figure 8.1-1 shows the locations of these sites. Overall MADT volumes have increased from 2009 to 2011 with larger volumes occurring close to the City of Edmonton, likely due to commuters driving from the City of Spruce Grove and the Town of Stony Plain. Throughout the Edmonton Region, MADT volumes are highest during the summer months. For example, in the Town of Stony Plain 2012 MADT volumes ranged from a low of 19,891 in January to a high of 30,713 in August (Alberta Transportation 2012).

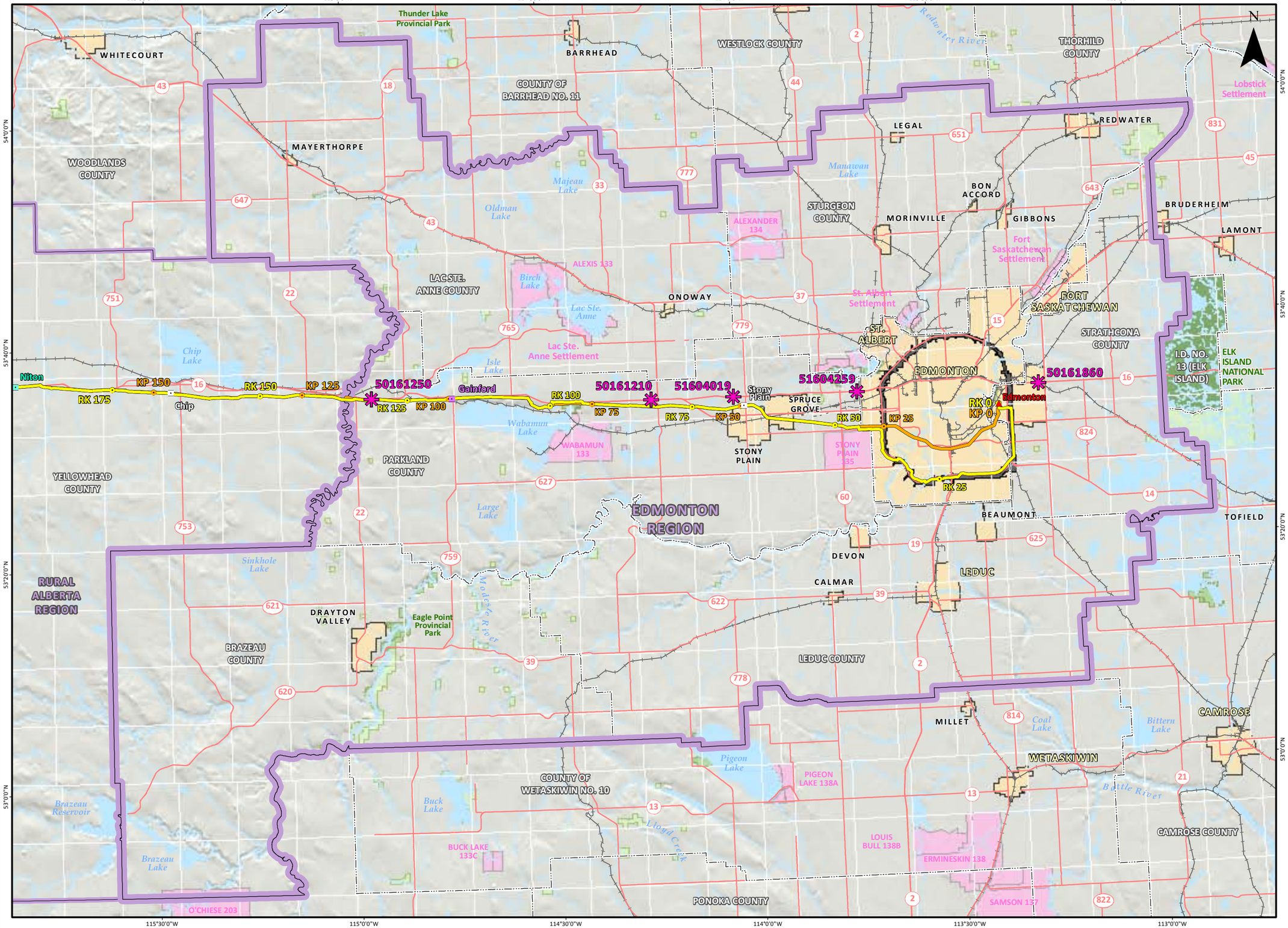
Beginning in Strathcona County, the proposed pipeline corridor lies within the TUC from approximately RK 2.4 to RK 41.8 and also crosses three provincial highways:

- Highway 216 (approximately RK 2.5, RK 12, RK 14.5, RK 17.5, RK 21, RK 21.5, RK 27.5, RK 34.7, RK 38);
- Wye Road (Highway 630) (approximately RK 5.4);
- Calgary Trail (Highway 2 Queen Elizabeth II (approximately RK 22.9); and
- Whitemud Drive NW (approximately RK 8.7 and RK 43.5).

According to the Edmonton MDP, the proposed pipeline corridor also crosses in close proximity (less than 200 m) from a city bus depot (approximately RK 5.3). The Strathcona County MDP supports the development of pipeline/utility corridors (in consultation with interested and affected parties) if: it maintains/enhances the integrity of the existing network; mitigates negative impacts; minimizes land use conflicts (such as land fragmentation); does not deter future development opportunities; and/or parallels existing or future transportation network (Strathcona County 2007).

On average, 2.5 million daily trips are made by City of Edmonton residents, 77% of which are made by car and 9% by public transit. There are also many daily goods and services trips made within Edmonton. The Edmonton Transportation Master Plan indicates routes of goods and services trips. The proposed pipeline corridor crosses one of these routes (Highway 216 at approximately RK 3) where an estimated 2,400 - 3,600 vehicles use this on a daily basis. The Edmonton Transportation Master Plan also states the predicted volume increase from 2006-2040 (City of Edmonton 2009).

The proposed pipeline corridor also crosses through an area for a proposed collector road at approximately RK 58. According to the Spruce Grove MDP, the proposed pipeline corridor crosses through an area zoned for institutional uses (a potential bus yard) at approximately RK 58.



TRANS MOUNTAIN

FIGURE 8.1-1

PERMANENT TRAFFIC MEASUREMENT SITES – EDMONTON REGION

TRANS MOUNTAIN EXPANSION PROJECT

- Kilometre Post (KP)
- Reference Kilometre Post (RK)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Terminal
- Pump Station (Pump Additions, Station Modifications and/or Scraper Facilities)
- Pump Station (Reactivated)
- Existing Pump Station
- Permanent Traffic Measurement Site
- Highway
- Railway
- Socio-economic RSA Boundary
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- Transportation and Utility Corridor (TUC)
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Municipal / District Boundary

Projection: NAD 1983 UTM 11N. Baseline TMPL: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, August 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infrastructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: ESRI, 2009.

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Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

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The proposed pipeline corridor crosses over a route for a proposed arterial road along the northern boundary of the Town of Stony Plain (approximately RK 64 to RK 69), and crosses over a future collector route (approximately RK 62) (Armin A. Preiksaitis & Associates 2005).

The Wabamun MDP notes that vehicle transportation routes are vital for the Village of Wabamun's economic development (Village of Wabamun 2010).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to road infrastructure in the Edmonton Region.

- Strathcona County identified that the proposed pipeline corridor crosses under Baseline Rd. (approximately RK 0 to RK 1) which is a well-used transportation route. A county road (approximately RK 10.5) will be extended and land in the area will be developed in the future. Depth of pipeline is an important consideration in future municipal planning (Mills pers. comm.).

- No traffic issues were identified by the City of Spruce Grove, although the number of trains going through the city has increased in recent years resulting in a change in the flow of traffic (traffic slows when vehicles stop for more trains) (Irving pers. comm.).

- As a result of previous projects Parkland County has experienced increases in traffic, resulting in vehicle accidents (Hanlan pers. comm.).

- No traffic issues were identified by the Town of Stony Plain. Most vehicles use the Highway 16, located north of the Town of Stony Plain, instead of travelling through the town. The Town of Stony Plain indicated concern with the condition of some highways, such as Highway 779 (too narrow in certain areas) (Frostad pers. comm.).

- Concern regarding commercial vehicle traffic, speeding and safety was identified at the Wabamun Community Workshop. It was noted that there is heavy traffic on Wabamun roads.

- The Village of Wabamun identified a disruption to road access and traffic as concerns. There are many commuters in the Village of Wabamun and a large influx of summer tourists (Hannah pers. comm.).

8.1.1.2 Airports

There are numerous airports, private airfields and heliports in the Edmonton Region. Airports located in the vicinity of the Project are presented in Table C-2 in Appendix C. The largest airport in the Edmonton Region is the Edmonton International Airport, located 10.6 km south of the Project, is the main airport and is owned and operated by Edmonton Airports, a financially independent, community-based, non-share corporation. Edmonton International Airport has non-stop service to over 50 national and international destinations and serves over 6 million passengers per year (Edmonton International Airport 2012).

Edmonton Airports also manages three additional airports: Edmonton City Airport; Villeneuve Airport; and Cooking Lake Airport. Edmonton City Airport is located 10.9 km from RK 0.0 and is home to training, military, industrial and medevac flights as well as small charters, private and corporate aircraft. Cooking Lake Airport is located 14.4 km from RK 11.1 of the Project. Primarily functioning as a recreational flying facility for small aircraft and floatplanes, Cooking Lake airport is the only facility in Alberta with both a conventional runway and a floatplane base. Stony Plain (Lichtner Farms) Airport is located 1.5 km from RK 62.6. Villeneuve Airport is located 14.6 km from RK 64.1 and functions as the primary flight-training facility for the Edmonton Capital Region (Edmonton International Airport 2012).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to airports in the Edmonton Region.

8.1.1.3 Rail

The CPR travels north to south through the City of Edmonton. There are approximately two CPR stations along the proposed pipeline corridor of the Edmonton Region (Table C-3 in Appendix C) (CPRS 2012). The CN railway parallels the proposed pipeline corridor from approximately RK 0.0 to RK 12 and from approximately RK 60 to RK 135.0. There are approximately 12 stations along the proposed pipeline corridor of the Edmonton Region (Table C-3 in Appendix C) (CN 2012). There are five rail crossings along the proposed pipeline corridor within this region. Crossings are located at RK 12.0, RK 23.0, RK 23.0, RK 61.5 and RK 118.6

Sherwood Park Urban Service Area, the City of Edmonton, the City of Spruce Grove, the Town of Stony Plain and the Village of Wabamun all have railway stations.

The proposed pipeline corridor crosses an existing Light Rail Transit route in the City of Edmonton (approximately RK 25) and a potential Light Rail Transit extension route (approximately RK 16). The existing route transports people from the northeast of the city, through downtown and to the University campuses (City of Edmonton 2009).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), no issues were identified with respect to railways in the Edmonton Region.

8.1.1.4 Ports

There are no known ports located in the Edmonton Region.

8.1.2 Transportation Infrastructure – Rural Alberta Region

The following subheadings describe existing transportation infrastructure related to roads and traffic, airports, railways and ports in the Socio-Economic RSA of the Rural Alberta Region.

8.1.2.1 Roads

In the Rural Alberta Region, the proposed pipeline corridor loosely parallels Highway 16. Communities in the Rural Alberta Region are serviced by Highway 16, and this highway is crossed by the proposed pipeline corridor at several points (see Table 8.1-1). Highway 16 is anticipated to be the main highway utilized for the movement of equipment and materials to various pipeline spread locations along this portion of the proposed pipeline corridor.

The Town of Edson is serviced by Highway 16 which passes through the town along the twinned alignments of 2nd and 4th Avenues. There are early plans to relocate Highway 16 so that it bypasses the town. Secondary Highway 748 defines the northern boundary of the Town of Edson and provides access to rural areas north and east of the town (Town of Edson 2006).

There are four permanent traffic measurement sites located on Highway 16 within the Rural Alberta Region. Traffic count data is available for 2009, 2010 and 2011 for the sites along Highway 16. Table C-1 in Appendix C presents the MADT volumes for these sites and Figure 8.1-2 shows the locations of these sites. Overall MADT volumes have increased from 2009 to 2011 with larger volumes occurring close to the Town of Edson and the Town of Hinton, likely due to commuters. Throughout the Rural Alberta Region, MADT volumes are highest during the summer months. For example, in the Town of Hinton, 2012 MADT volumes ranged from a low of 4,697 in January to a high of 8,295 in August (Alberta Transportation 2012).

The Yellowhead County MDP notes that the maintenance of transport routes are essential for the economic success and quality of life of communities within Yellowhead County. One of the objectives of the Yellowhead County MDP is to maintain and expand existing routes (especially Highway 40 and 47) in order to ensure the movement of goods and people. The Yellowhead County MDP also states that applicants (for new development) may need to submit an Area Structure Plan, which includes describing how the proposed development's transportation network will link with Yellowhead County's transportation system (Yellowhead County 2006).

TRANS MOUNTAIN

FIGURE 8.1-2

PERMANENT TRAFFIC MEASUREMENT SITES – RURAL ALBERTA REGION

TRANS MOUNTAIN EXPANSION PROJECT

- Town / Village / Hamlet
- Kilometre Post (KP)
- Reference Kilometre Post (RK)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Terminal
- Pump Station (Pump Additions, Station Modifications and/or Scraper Facilities)
- Pump Station (Reactivated)
- Existing Pump Station
- Permanent Traffic Measurement Site
- Highway
- Railway
- Socio-economic RSA Boundary
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Municipal / District Boundary
- Provincial Boundary

Projection: NAD 1983 UTM 11N. Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, Aug. 23, 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infstructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: ESRI, 2009.

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Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

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ALL LOCATIONS APPROXIMATE

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The Edson MDP encourages buffers, increased setbacks, landscaping and traffic management, in order to reduce the negative impacts on major transportation routes within the town (Town of Edson 2006).

The Hinton MDP describes rural highways as principal routes for through traffic, and urban arterials major links of large volume traffic. The Hinton MDP describes Robb Road (crossed at approximately RK 322) as a high truck traffic route and that expansion to Robb Road will be needed in the future. The proposed pipeline corridor crosses along a route designated for a future Highway 16 bypass (along the southern boundary of Hinton). The need for this bypass is dependent on the maintenance of Highway 16 as a through traffic function (Town of Hinton 1998).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to road infrastructure in the Rural Alberta Region.

- Yellowhead County identified that traffic is not heavy within the region. In the summers there is some additional RV traffic. There was no issue within Yellowhead County with pipe haul on roads during the TMX Anchor Loop Project (Ramme, Lyons pers. comm.).

- The Town of Edson identified that summer months are busy on the highways; no heavy trucks are permitted through the Town of Edson and must use Highway 748 (Lemieux pers. comm.).

- No traffic issues were identified by the Town of Hinton. The town acted as a storage area for the TMX Anchor Loop Project; materials transported by truck were stored in Hinton before being brought to work-sites in the Municipality of Jasper. Potential storage sites are still available in Hinton (Kreiner pers. comm.).

8.1.2.2 Airports

There are numerous airports, private airfields and heliports in the vicinity of the Rural Alberta Region. Airports located in the vicinity of the Project are presented in Table C-2 in Appendix C.

There are two airports close to the proposed pipeline corridor. The Edson Airport is located approximately 1.5 km from RK 235.8. Edson Airport is classified as a medium airport and has one paved runway (1,829 m) with no scheduled airline service (Edson Airport 2012). Maintained by Yellowhead County, the Jasper-Hinton Airport is located 2.9 km from RK 335.2. The Jasper-Hinton Airport is unmanned with maintenance staff keeping the runways safe and clear of debris, ice and snow (Town of Hinton 2013).

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to airports in the Rural Alberta Region.

8.1.2.3 Rail

CN parallels the entire proposed pipeline corridor in the Rural Alberta Region from RK 135.0 to RK 339.4. There are approximately 31 stations along the proposed pipeline corridor in the Rural Alberta Region (Table C-3 in Appendix C) (CN 2012). There are six rail crossings along the proposed pipeline corridor within this region. Crossings are located at RK 228.1, RK 252.9, RK 259.7, RK 279.6, RK 303.7 and RK 311.8. The Town of Edson and the Town of Hinton both have railway stations.

Depending on where the pipeline materials are sourced, it is expected that some of the construction equipment and materials may be transported by rail to the closest station, and transported to sites along the proposed pipeline corridor by truck.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to railways in the Rural Alberta Region.

8.1.2.4 Ports

There are no known ports located in the Rural Alberta Region.

8.1.3 Transportation Infrastructure – Jasper National Park Region

The following subheadings describe existing transportation infrastructure related to roads and traffic, airports, railways and ports in the Socio-Economic RSA of the Jasper National Park Region.

8.1.3.1 Roads

The main highway in the Jasper National Park Region is Highway 16, which also services the Municipality of Jasper (Table 8.1-1). Highway 16 is anticipated to be the main highway utilized for the movement of Project-related equipment and materials during construction related to the Jasper Pump Station and the Hinton to Hargreaves reactivated segment. This highway is a two-lane east-west highway with passing lands and pullouts. Highway 93 and 93A are located in the Socio-Economic RSA and provide access from areas in southern Alberta, including Calgary, Banff National Park and Lake Louise. Highway 93 and 93A intersect with Highway 16 south of the Municipality of Jasper (TERA Environmental Consultants 2005). Highway 93 is a tourist route, and heavy vehicles are not permitted (Deagle pers. comm.).

There are 2 permanent traffic measurement sites located on Highway 16 within the Jasper National Park Region. Traffic count data is available for 2010, 2011 and 2012 for the sites along Highway 16. Table C-1 in Appendix C presents the MADT volumes for these sites and Figure 8.1-3 shows the locations of these sites. MADT volumes have increased from 2010 to 2012 with larger volumes occurring in the summer months of June, July and August due to tourist traffic.

The Municipality of Jasper identified that the Jasper Pump Station access road is in the same area as the municipal transfer station; ensuring Project activities do not interfere transfer station access is a key interest (Pickle pers. comm.).

8.1.3.2 Airports

The closest airport to the Jasper National Park Region is the Jasper-Hinton Airport, located approximately 65 km east of the Municipality of Jasper. There is an airstrip located in the Jasper National Park Region. In March 2009, the Government of Canada made a decision to relist the Jasper airstrip for use by emergency and diversionary purposes, as well as for private aircraft (Parks Canada 2010). The Jasper Airstrip opened to non-commercial recreational aircraft by permit in February 2013 (Parks Canada 2013).

The nearest international airport is the Edmonton International Airport. Commercial airports are also located in Prince George and Kamloops, BC (TERA Environmental Consultants 2005). Airports located in the vicinity of the Project are presented in Table C-2 in Appendix C.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, no issues were identified with respect to airports in the Jasper National Park Region.

8.1.3.3 Rail

There are 8 CN stations in the Jasper National Park Region (Table C-3 in Appendix C) (CPR 2012, CN 2012).

During socio-economic technical discussions (Table 2.1-1 in Section 2), the Municipality of Jasper indicated that increased rail traffic may have vibration/nuisance impacts for Jasper residents (Jenkins pers. comm.). The Vista Coal Mine Project located near Hinton may also contribute to increase the number of trains/rail traffic through the Municipality of Jasper (Waterworth pers. comm.).

Depending on where the pipeline materials are sourced, it is expected that some of the construction equipment and materials may be transported by rail to the closest station, and transported to sites along the proposed pipeline corridor by truck.

8.1.3.4 Ports

There are no known ports located in the Jasper National Park Region.

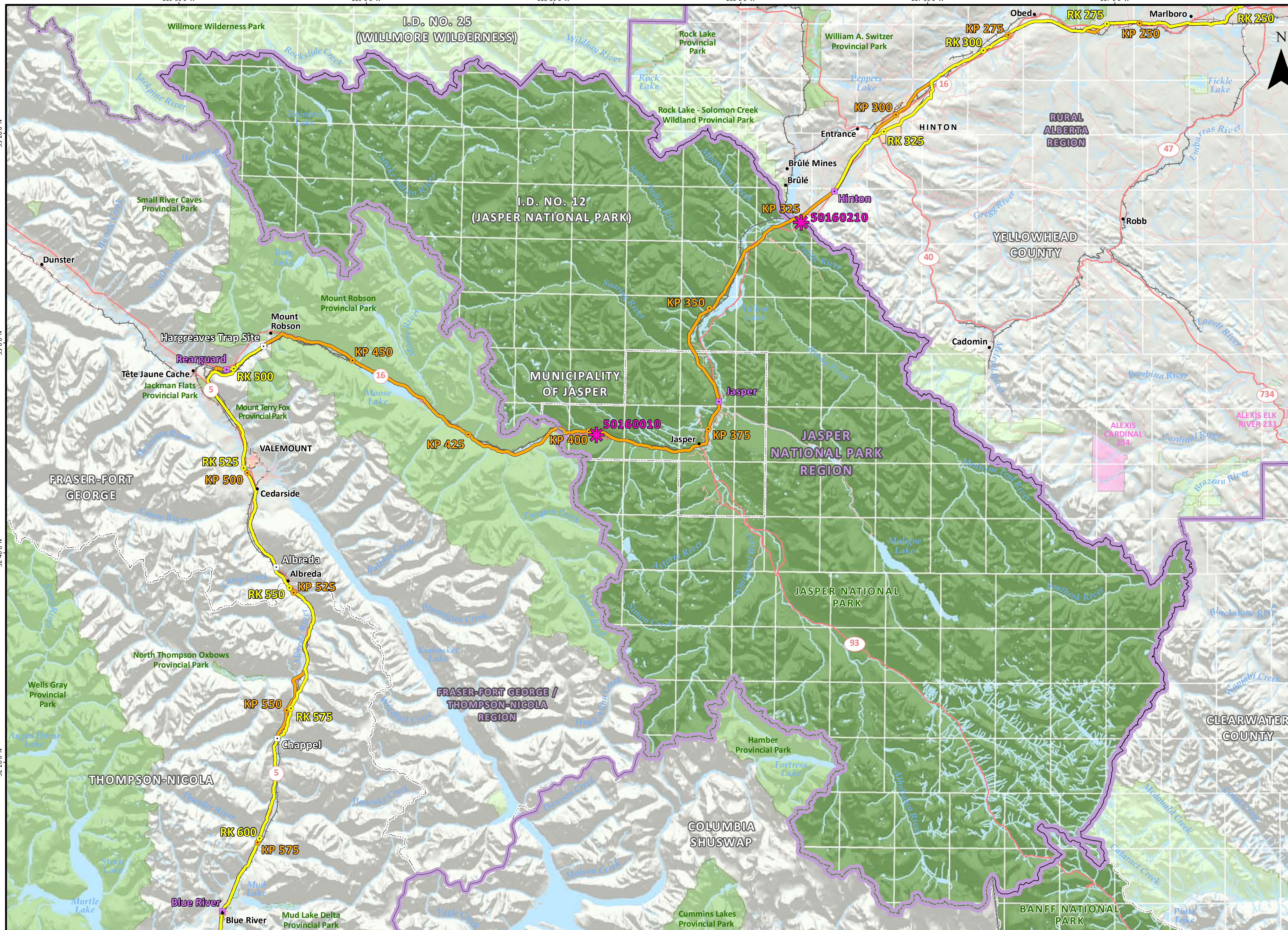

FIGURE 8.1-3

PERMANENT TRAFFIC MEASUREMENT SITES – JASPER NATIONAL PARK REGION

TRANS MOUNTAIN EXPANSION PROJECT

- Town / Village / Hamlet
- Kilometre Post (KP)
- Reference Kilometre Post (RK)
- Existing Trans Mountain Pipeline
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Pump Station (Pump Additions, Station Modifications and/or Scraper Facilities)
- Existing Pump Station
- Permanent Traffic Measurement Site
- Highway
- Railway
- Socio-economic RSA Boundary
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Municipal / District Boundary
- Provincial Boundary

Projection: NAD 1983 UTM 11N. Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, August 23, 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infrstructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: ESRI, 2009.

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Although there is no reason to believe that there are any errors associated with the data used to generate this product or in the product itself, users of these data are advised that errors in the data may be present.

MAP NUMBER 201310_MAP_TERA_SE_00460_REV0_03		PAGE SHEET 3 OF 6
DATE December 2013	TERA REF. 7894	REVISION 0
SCALE 1:650,000	PAGE SIZE 11x17	DISCIPLINE SE
DRAWN AJS	CHECKED TPH	DESIGN TGG

km 0 5 10 15 20 25

ALL LOCATIONS APPROXIMATE

201310_MAP_TERA_SE_00460_Rev0_03.mxd

8.1.4 Transportation Infrastructure – Fraser-Fort George/Thompson-Nicola Region

The following subheadings describes existing transportation infrastructure related to roads and traffic, airports, railways and ports in the Socio-Economic RSA of the Fraser-Fort George/Thompson-Nicola Region.

8.1.4.1 Roads

In the Fraser-Fort George/Thompson-Nicola Region, the Project loosely parallels Highway 16 from approximately RK 489.6 to RK 505, Highway 5 (Southern Yellowhead Highway) from approximately RK 507 to RK 842 and Highway 5 (Coquihalla Highway) from approximately RK 911.6 to RK 991.1.

Highways 5 and 16 are crossed by the proposed pipeline corridor at multiple points (RK 521.9, RK 529.6, RK 545.6, RK 552.3, RK 582.6, RK 608, RK 625.6, RK 626.9, RK 651, RK 655.5, RK 660.9, RK 686.5, RK 688.2, RK 689, RK 692.5, RK 695, RK 704.1, RK 708.1, RK 710, RK 710.7, RK 714.1, RK 717.1, RK 718.9, RK 726.4, RK 727.6, RK 737, RK 758, RK 760.1, RK 761, RK 762, RK 762.8, RK 763.6, RK 767.7, RK 926.5, RK 929.7, RK 938.7, RK 940.1, RK 966.5, RK 980.5). Trans-Canada Highway 97 is crossed by the proposed pipeline corridor at RK 850.5 in Kamloops.

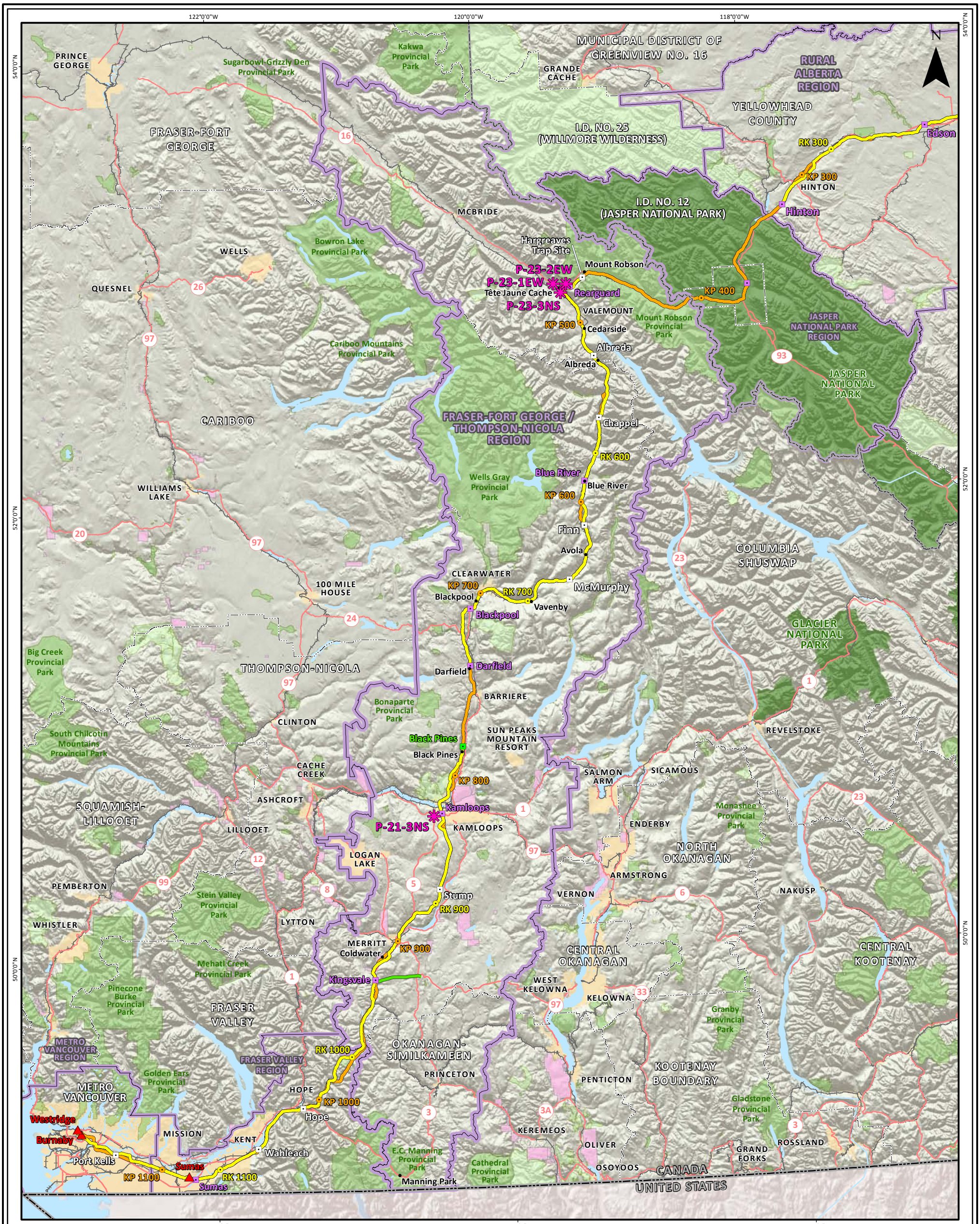
Both the Southern Yellowhead and Coquihalla sections of Highway 5 are the main vehicle route along the proposed pipeline corridor. Highway 5 is a north-south two lane route with numerous portions expanded to four lanes for passing. Highway 5 provides the shortest land route from Vancouver to Edmonton and connects the northern Highway 16 with the southern Trans-Canada route. The Coquihalla Highway is a tourism travel corridor, connecting the Lower Mainland with the Okanagan and interior BC (BC Ministry of Transportation and Infrastructure 2012a). The Trans-Canada Highway (97) is crossed at one location in the Fraser-Fort George/Thompson-Nicola Region, at RK 850.5.

Highway 5 is anticipated to be the main highway utilized for the movement of equipment and materials to various pipeline spread locations in this region.

There are three permanent traffic measurement sites located on Highway 16 within the Fraser-Fort George/Thompson-Nicola Region. Traffic count data is available for 2010, 2011 and 2012 for these sites. Table C-4 in Appendix C presents the MADT (AADT and AADTM) volumes are available for these sites and Figure 8.1-4 shows the locations of these sites. Overall MADT volumes have slightly increased from 2010 to 2012 with larger volumes occurring close to the City of Kamloops, likely due to commuters from the region as Kamloops is the largest city in the Fraser-Fort George/Thompson-Nicola Region. Throughout the Fraser-Fort George/Thompson-Nicola Region, MADT volumes are highest during the summer months. For example, west of the City of Kamloops, 2012 MADT volumes ranged from a low of 5,412 in January to a high of 13,537 in August (BC Ministry of Transportation and Infrastructure 2012b).

There is one permanent traffic measurement site located on Highway 5 within the Fraser-Fort George/Thompson-Nicola Region. Traffic count data is available for 2010, 2011 and 2012 for the site. Table C-4 in Appendix C presents the MADT (AADT and AADTM) volumes are available for the site and Figure 8.1-4 shows the location of the site. Overall MADT volumes have remained consistent with a slight decrease from 2010 to 2012. The 2012 MADT volumes range from a volume of 5,412 in January to 10,830 in June. The permanent traffic measurement site on Highway 5 is considered highly seasonal, as evidenced by the difference in monthly average daily traffic between winter and summer months. Increased traffic during summer months is likely due to travel associated with tourism, recreation and construction.

The TNRD RGS notes that major transportation and utility corridors must be protected for their existing function and potential expansion. The TNRD RGS also states that provincial, regional and local transportation goals must be recognized in order to ensure effective transportation of people and goods (TNRD 2000).



tera ENVIRONMENTAL CONSULTANTS

- Town / Village / Hamlet
- Reference Kilometre Post (RK)
- Kilometre Post (KP)
- Trans Mountain Pipeline (TMPL)
- Trans Mountain Expansion Project Proposed Pipeline Corridor
- Proposed Power Line
- Terminal
- Pump Station (Pump Additions, Station Modifications and/or Scraper Facilities)
- New Pump Station (Proposed)
- Existing Pump Station
- Permanent Traffic Measurement Site
- Highway
- Railway
- Socio-economic RSA Boundary
- City / Town / District Municipality
- Indian Reserve / Métis Settlement
- National Park
- Provincial Park
- Protected Area / Natural Area / Provincial Recreation Area / Wilderness Provincial Park / Conservancy Area
- Regional District Boundary
- Provincial Boundary
- International Boundary

Projection: NAD 1983 UTM 10N. Baseline TMPL & Facilities: provided by KMC, 2012; Proposed Pipeline Corridor V6: provided by UPI, Aug. 23, 2013; Transportation: IHS Inc., 2013, BC Forests, Lands and Natural Resource Operations, 2012 & Natural Resources Canada, 2012; Geopolitical Boundaries: Natural Resources Canada, 2003, AltaLIS, 2013, IHS Inc., 2011, BC FLNRO, 2007 & ESRI, 2005; First Nation Lands: Government of Canada, 2013, AltaLIS, 2010 & IHS Inc., 2011; Hydrology: Natural Resources Canada, 2007 & BC Crown Registry and Geographic Base Branch, 2008; Parks and Protected Areas: Natural Resources Canada, 2012, AltaLIS, 2012 & BC FLNRO, 2008; ATS Grid: AltaLIS, 2009; Edmonton TUC: Alberta Infrstructure, 2011; Canadian Hillshade: TERA Environmental Consultants, 2008; US Hillshade: ESRI, 2009; World Shaded Relief: Copyright:© 2013 Esri

TRANS MOUNTAIN

FIGURE 8.1-4

PERMANENT TRAFFIC MEASUREMENT SITES – FRASER-FORT GEORGE / THOMPSON-NICOLA REGION

TRANS MOUNTAIN EXPANSION PROJECT

MAP NUMBER	201310_MAP_TERA_SE_00460_REV0_04		PAGE: SHEET 4 OF 6
DATE: December 2013	TERA REF.: 7894		REVISION: 0
SCALE: 1:1,800,000	PAGE SIZE: 11x17		DISCIPLINE: SE
DRAWN: AJS	CHECKED: TPH		DESIGN: TGG

0 20 40 60 80 Km

ALL LOCATIONS APPROXIMATE

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to road infrastructure in the Fraser-Fort George/Thompson-Nicola Region.

- Disruption of access roads during construction was identified as an issue at the Valemount Community Workshop, particularly to the Canoe River Campground, Yellowhead Campground, Irvine Park and Campground and Loseth Road.

- Traffic congestion during construction was identified as an issue at the Valemount Community Workshop. It was noted that there is only one road in and out of the Village of Valemount, moreover, Highway 5 is heavily used in summer months by tourists and river rafting companies.

- Traffic congestion at approximately RK 645 was noted as an issue at the Blue River Community Workshop, due to a lookout stop.

- The District of Barriere identified issues related to highway traffic due to heavy equipment/heavy load vehicles for the Project using Highway 5 (Humphreys, Hannigan pers. comm.).

- The importance of ensuring Project-related drivers are training in road safety and sharing information with communities regarding Project-related haul dates/timing (Humphreys, Hannigan pers. comm.).

- The potential disruption of single access roads in the City of Kamloops during construction; specifically, Mission Flats Road (access for Weyerhaeuser landfill, Kamloops landfill and wastewater treatment plant), Westsyde Road (single access for residents and other land users), Ord Road and Tranquille Road (access to airport; Tranquille Road is a truck route) (Fretz pers. comm.).

- Access to the right-of-way in the less developed areas of the City of Kamloops where there are few existing roads will be problematic (Lambright pers. comm.).

- The City of Merritt noted there are four major mines in the vicinity of Merritt with crews living in the city being bussed to worksites; this also contributes to local traffic (O'Flaherty pers. comm.).

8.1.4.2 Airports

There are four airports, a number of private airfields and a number of heliports in the vicinity of the Fraser-Fort George/Thompson-Nicola Region (Table C-5 in Appendix C).

The proposed pipeline corridor crosses the Merritt Airport (Saunders Field) at RK 926.9. The Merritt Airport is managed by the City of Merritt; the city has an Airport Committee. The airport is used by the Merritt Flying Club; as of 2011, the Merritt Flying Club was responsible for fueling and tie downs at the airport (City of Merritt 2011c). It was noted that the largest aircraft that are able to use Merritt's airport are small jets. There are no commercial flights operating out of the Merritt Airport. The City of Merritt indicated it has plans to expand the municipal runway. The current runway is 1,219 m; however fire planes require a 1,524 m runway (O'Flaherty pers. comm.). The runway cannot be expanded southwards because of a steep slope and an existing road. The city notes the only direction in which runway expansion could occur is to the northeast (over the existing TMPL right-of-way). Merritt has received approval to be a BC forest fighting centre, and use of the airport will likely increase with wildfire training (Umpherson pers. comm.). There are two helicopter companies in the city that in part service mining companies (Umpherson pers. comm.). The City of Merritt also identified potential for fire fighting training grounds near the airport (Noble pers. comm.).

The Merritt OCP states that the only uses permitted in the airport commercial areas are aircraft and helicopter sales, rental, storage and repair facility; bulk petroleum product sales; delivery and express facility; offices required for the operation of airport; public transportation depot including bus terminal, airport and heliport; public use; warehouse and accessory building. The OCP also notes that no development of any kind shall be permitted between the eastern end of the airport and the City boundary in order to preserve take off approach surface (City of Merritt 2011a).

The proposed pipeline corridor is also in close proximity to the Kamloops Airport (0.1 km from RK 846.3), the largest airport in the region. The airport offers regular air service to Vancouver and Prince George, BC, and Calgary, Alberta. The airport has two runways and serves passenger travel, air cargo traffic and houses aviation-related industrial operations (Kamloops Airport Ltd. 2012). The proposed pipeline corridor crosses the airport zone designated by the Kamloops Airport Area Land Use and Development Plan. No runways, terminal buildings, charter businesses, aircraft sales and repairs or training schools are crossed by the proposed pipeline corridor. Public access roads to the main terminal and sea plane base area are crossed by the proposed pipeline corridor. The proposed pipeline corridor also crosses a railway which can be utilized to transport goods to the airport.

Other communities in the Fraser-Fort George/Thompson-Nicola Region with paved airports or airstrips are Merritt, Valemount, Blue River and Princeton.

8.1.4.3 Rail

The CN Railway loosely parallels the proposed pipeline corridor from the Alberta-BC border to the City of Kamloops. There are 45 CN stations and 6 CPR stations in the vicinity of the proposed pipeline corridor in the Fraser-Fort George/Thompson-Nicola Region (Table C-6 in Appendix C) (CN 2012, CPR 2012).

There are 19 rail crossings along the proposed pipeline corridor within this region. Crossings are located at RK 500.4, RK 501.3, RK 506.7, RK 516.2, RK 518.9, RK 529.5, RK 545.7, RK 547.7, RK 552.2, RK 558.6, RK 567.2, RK 580.9, RK 617.5, RK 653.6, RK 657.3, RK 658.6, RK 844.9, RK 845.2 and RK 847.5.

South of Kamloops, there is no railway in the vicinity of the proposed pipeline corridor. Kamloops is a hub for freight and passenger rail carriers. CN rail systems includes a mainline and a feeder line, the CPR rail system consists of a mainline and VIA Rail Canada operates a passenger route (Natural Resources Canada 2008). The Kamloops North Station is utilized by VIA Rail Canada for passenger service (VIA Rail Canada 2012).

Depending on where the pipeline materials are sourced, it is expected that some of the construction equipment and materials may be transported by rail to the closest station, and transported to sites along the proposed pipeline corridor by truck.

8.1.4.4 Ports

There are no known ports located in the Fraser-Fort George/Thompson-Nicola Region.

8.1.5 Transportation Infrastructure – Fraser Valley Region

The following subheadings describe existing transportation infrastructure related to roads and traffic, airports, railways and ports in the Socio-Economic RSA of the Fraser Valley Region.

8.1.5.1 Roads

In the Fraser Valley Region, the Project parallels Highway 5 (Coquihalla Highway) from approximately RK 991.1 to RK 1035.1 and Highway 1 (Trans-Canada Highway) from approximately RK 1045 to RK 1088.6. Highway 5 and Highway 1 are the main vehicle routes located in the area. Highway 5 continues to be a north-south two lane route with numerous portions expanded to four lanes for passing within this region. The Trans-Canada Highway, Canada's longest national road, connects provincial highways to the Pacific coast and is a four lane (two lanes in each direction) route within this region (Transport Canada 2012). Highway 5 and Highway 1 are crossed by the proposed pipeline corridor at several locations. Highway 11 is crossed by the proposed pipeline corridor at RK 1123.8. Highway 5 and Highway 1 are anticipated to be the main highways utilized for the movement of equipment and materials to various pipeline spread locations in this region.

In the Project area, Highway 5 services Hope and Highway 1 services Hope, Chilliwack, Abbotsford and rural areas. The District of Hope is located at the convergence of Highways 1, 3, 5 and 7, with access to

the Fraser Canyon, Metro Vancouver, the Okanagan and the Kootenays (Advantage Hope 2011). Any vehicle leaving or entering the Lower Mainland from the interior of the province must travel through Hope, therefore, the community is familiar with large vehicle traffic (Davidsen, Wilson pers. comm.). The Upper Fraser Valley Regional RCMP Detachment noted that on long weekends, Highway 1 between Chilliwack and Hope is bumper-to-bumper (Burleigh, Simmill pers. comm.). Any construction occurring during the summer would compound traffic-related issues; working or transporting goods at nigh could alleviate this issue. It was noted that the BC Ministry of Transportation and Infrastructure is interested in the continual flow of goods along highways (Simmill pers. comm.). The presence of large equipment vehicles on highways do not pose any issues because they are required to obtain necessary BC Ministry of Transportation and Infrastructure permits if they are oversized (Simmill pers. comm.). In the Fraser Valley Region, the Fraser Valley Traffic Services based in Chilliwack enforce traffic laws on arterial highways (Davidsen, Wilson pers. comm.). Section 8.6.6 discusses emergency services in the Fraser Valley Region.

In the District of Hope, the proposed pipeline corridor crosses, and is in close proximity to, Othello Road (crossed at approximately RK 1035.2) which currently requires upgrading to handle large equipment (Misumi pers. comm.). In Chilliwack, the proposed pipeline corridor is located in proximity to traffic corridors of concern. Vedder Road currently has congestion issues, while Tyson Road, Watson Road and Lickman Road are projected to become areas of traffic concern within the next 10 to 20 years. Vedder Road and Tyson Road are major arterial roads (ISL Engineering 2007).

There are three key transport corridors within Abbotsford: Highway 1 corridor connecting the Fraser Valley and Interior BC with Metro Vancouver, Highway 1A corridor connecting Abbotsford to Langley and Surrey and Highway 11 corridor that connects the north of Fraser Valley to the USA border via Washington State. The proposed pipeline corridor crosses two of these three corridors: Highway 1 (approximately RK 1113.6) and Highway 11 (approximately RK 1123.6) (City of Abbotsford 2007).

There is one permanent traffic measurement site located on Highway 5 within the Fraser Valley Region. Traffic count data is available for 2010, 2011 and 2012 for the site. Table C-4 in Appendix C presents the MADT (AADT and AADTM) volumes available for the site and Figure 8.1-5 shows the locations of the site. Overall MADT volumes have remained consistent from 2010 to 2012. The permanent traffic measurement site is considered highly seasonal, as evidenced by the large difference in monthly average daily traffic between winter and summer months. Increased traffic during summer months is likely due to travel associated with tourism and recreation. For example, in the District of Hope, 2012 MADT volumes ranged from a low of 5,456 in January to a high of 18,476 in August (BC Ministry of Transportation and Infrastructure 2012b).

Three permanent traffic measurement sites are located on Highway 1 within the Fraser Valley Region. Traffic count data is available for 2012 as well as 2010 and 2011 for most sites. Table C-4 in Appendix C presents the MADT (AADT and AADTM) volumes available for these sites and Figure 8.1-5 shows the location of these sites. Overall MADT volumes have remained consistent from 2010 to 2012 with larger volumes occurring in the cities of Chilliwack and Abbotsford, likely due to commuters moving between communities in the Fraser Valley Region. The permanent traffic measurement sites on Highway 1 near Hope and in Chilliwack are considered seasonal, as evidenced by the difference in monthly average daily traffic between winter and summer months. Increased traffic during summer months is likely due to travel associated with tourism and recreation. The permanent traffic measurement site on Highway 1 in Abbotsford is considered consistent, without large variations in monthly average daily traffic between winter and summer months.

During socio-economic technical discussions (Table 2.1-1 in Section 2.0), and broader Project engagement, the following issues were identified with respect to road infrastructure in the Fraser Valley Region.

- The District of Hope identified concerns regarding impacts to municipal roads and bridges, in particular the Othello Road (Fortoloczky, Vaughan pers. comm.). Othello Road will require upgrading to handle large equipment. The road is used for access to residences, tourist attractions and local

industry. A section of the road does not have a technical road right-of-way (Misumi pers. comm.). A Road Infrastructure Assessment may be needed (Fortoloczky, Vaughan pers. comm.).

- The City of Chilliwack raised concerns related to impacts on municipal infrastructure, more specifically impacts to roads. It was noted that there is a high density of existing municipal infrastructure in municipal roadways (Sanderson pers. comm.). Restrictions to activities, infrastructure and services are an issue for the city.

- In the City of Chilliwack there are approximately 30 municipal roads that are crossed by the existing Trans Mountain pipeline. Road crossings are areas where there is more risk of a spill related to digging. The city will be able to tell precise locations of road-crossings (road network plan) (Blain, Sanderson pers. comm.).

- Concern regarding construction vehicles tracking mud and dirt onto city streets was identified at the Chilliwack Community Workshop.